STWP REVIEW

JANUARY 1961

Volume 8 Number 1

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Send the original on heavy white bond paper, typewritten, double or triple spaced, plus two carbons. Leave at least a 1-inch margin on all sides, number the pages consecutively, and be sure that all illustrations are keyed to the text.

Articles should not exceed 2500 words plus three illustrations.

We assume that every article is approved by your company before it is submitted. The authors' names and affiliations should be on the manuscript. A short biographical note is most helpful. This note should include the present title of the author, the full name of his organization, and complete information about books, other articles, or any other publication credits. Please address all contributions to the Editor; the Review Committee will read your article and our publication plans will depend on their collective judgment.

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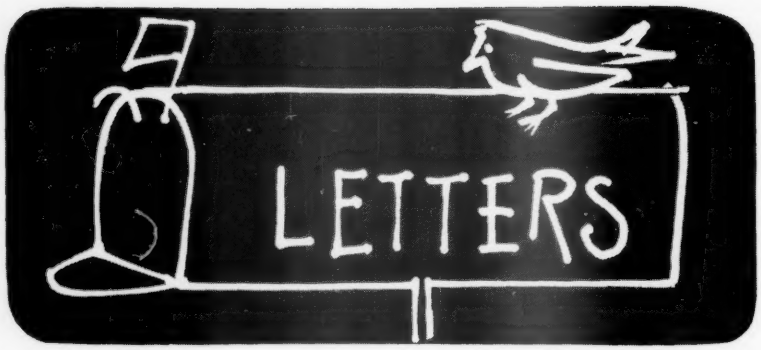

To Editor, *STWP Review*:

The technical report, a monthly, quarterly or semi-annual progress report, an extension of studies, or any of the special types of reports called for by a customer (usually military) can serve to keep the customer "sold." Keeping him sold is really another way of saying to him, "We'll let you retain prestige by helping to convince you that you did the right thing in making the purchase in the first place." The man or men who are instrumental in having your company selected for a special project must constantly justify their choice. Until the finished item is delivered or the work declared completed, all the customer gets is paper—statements of the status of the project. Your reports must create a favorable impression, i.e., good public relations.

What then creates the continuing favorable impression necessary to good public relations? There are factors such as approach, tone, content, appearance, both technical and visual, and timing.

The proper approach requires a knowledge of your audience. No ad man would try to sell steak knives to a Hindu, if he wants to sell him something else in the future. Respect for the position and ideas of your customer is essential. If your audience is highly technical, give them technical data. But leave out Gaussian equations when your report must go to administrative people. If you must have an omnibus report, give the nontechnical people a break and put in a well thought out summary in the front portion of the report. They will appreciate it.

A single philosophy should be apparent throughout all company reports. It is not sufficient for the cover to be the same or the type face identical; the organization should be as consistent as possible within the scope of the project. Ad agencies always use the same type face and logotype to identify the company to the reader. A like approach to technical reports tells the reader that there is a summary in a certain place, a conclusion is included, a bibliography is available, or whatever is common to all your reports. Once the reader knows where to find the items of interest to him, he is more inclined to read at least a portion of the report, and he will thank you for saving his effort.

Tone is the manner of speaking. Let your language be appropriate to your audience. No one likes to be condescended to. A few simple words in place of an abstruse one will go a long way toward making friends. On the other hand, don't use such simple language that you fail to convey your point. Use your language carefully and correctly.

Don't be too glowing when you describe your work; nobody will believe you, and you create a bad impression. Be the salesman who says his product cannot do certain things for which it was not designed; everything else will seem all the more believable. Be factual but be modest. The truth will "out" sooner or later. If you are proved wrong, you will suffer a loss of good will.

Content is important at all times. It is the area in which the greatest discretion must be exercised. Too much or too little on a subject is undesirable. The right amount makes the right impression. The organization of the report fits into this area. Make the report easy to use with adequate front matter, titles, breakdowns, tables, and illustrations. The more readable the report, the wider the circulation it will get and the more times your company's name comes before its important audience.

Appearance is a twofold problem. The first part that comes to mind is the matter of neatness, margins, good clean art, etc. From the public relations viewpoint, it is more than simply appearance. It is a reflection of the type of work your organization can do and actually does. Slipshod reports reflect a slipshod management. Even if this is not the case, how is the customer to know? Remember, all

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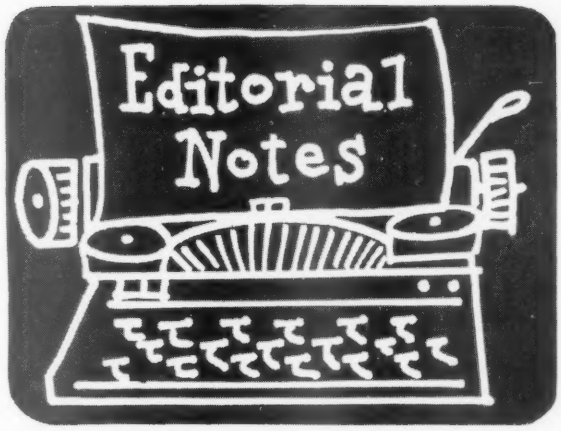

Last spring Mr. A. M. Sullivan, Editor of Dun's Review and Modern Industry, *spoke at a joint meeting of the Pittsburgh Chapter of STWP and the Associated Editors Society of Pittsburgh. His talk was interesting, inspiring, and instructive, and was highly regarded by his Pittsburgh audience. We are honored to publish Mr. Sullivan's talk as our guest editorial.*

WORDS — TOOLS OF THOUGHT

Semantics, the meaning of meanings, is the art of conveying exact ideas, impressions, or messages by the use of the spoken or written word.

One of the greatest consumers of time, paper, and telephone lines is the lack of precise information. So, lacking precise information in direction or specification, we use thousands of words to revise, enlarge, or replace thousands of other words.

But how well do we express ourselves?

Most wars, lawsuits, and arguments are the result of bad definitions of peace, honor, justice, and ownership of things. Bad definitions and lack of definition lead to misunderstanding.

The first requisite to understanding is the will to be understood. Language can be employed to confuse, to mislead, to deceive as well as to convey exact meanings. Is lack of vocabulary the principal reason? Not always. Clarity and control come from clear thinking and steady practice at the art of communication. Some educators, many professional and scientific men with large vocabularies, have difficulty in expressing themselves and conveying exact meanings. The use of language carries with it an ethical responsibility.

When we say of a man, "He doesn't speak our language," what do we mean? This familiar phrase, heard so often in business discussions, has many shades of meaning. Often, it implies that lack of understanding is a problem more of ethics than of facts, more of definition than of communication.

Precise meaning is just as important in business as in diplomacy, both of which are often afflicted with the vagueness of doubletalk. Since we use words to communicate, is there any reason why we can't find an accurate and acceptable vocabulary for the exchange of ideas, opinions, and values?

A DESIRE TO COMMUNICATE

Perhaps the nub of the problem is the "will to be understood." Where this mutual desire exists, doubts can be resolved in candor without resort to hedging or gobbledegook. Where it is lacking, communication falters. No words have ever been devised that will make men honest if their motives are not. Contracts between management and labor, between vendor and supplier depend on mutual acceptance and good faith. Written words may clarify the obligation, but they can never enforce it unless promise and performance are welded by sincerity of intent.

Mankind has long recognized the need of a common language. Leaders in diplomacy, religion, and trade have sought a synthetic tongue to serve their needs and avoid the verbal barriers to understanding. Esperanto is reputed to have a million fluent speakers and enjoys some commercial use. It had considerable backing among the delegates to the defunct League of Nations, an organization which failed because of the international lack of the "will to be understood." The same problem faces the United Nations today.

Trade is occasionally more successful than diplomacy in finding a common ground for agreement. Twenty-nine million people in Central Africa speak Swahili, a vagrant tongue of mixed Bantu and Arabic origin that aids the business intercourse of fifteen countries from Ghana to Ethiopia. Cantonese is a mongrel Chinese tongue, borrowing freely from Portuguese and English to serve the coastal trade of China. Pidgin English, an amazing species of basic English that is devoid of grammar but embellished by inflection and gesture, is a recognized and well-used instrument of commercial bartering in the harbors and bazaars of the Indies.

GOOD FAITH A REQUISITE

A common language, then, is not so important as a common need for fair exchange in faith as well as in goods or money. Any man can speak "the other fellow's language" if he means what he says and backs up his words with action. Whether in business conversation, advertising, or warranties, words have to be taken at face value because they determine the image by which the individual or the corporation is measured and judged. The man who is as good as his word speaks every man's language, because his will to be understood is apparent in every sentence he utters and every promise he makes.

(Continued on Page 27)

The Technical Editor in Industry*

B. H. Weil

Technical editors have now been used in industry and in related organizations for a number of years. Much has been written about them and about their work; the latter has even been the subject of a section of a book.[1] A survey of users was made in 1953 by John A. Walter and Gordon Mills.[2] R. H. Hamre submitted a thesis in 1957 which surveyed the education, experience, and opinions of technical editors in chemical fields.[3]

In recent years, however, there has been a growing tendency to confuse these internal technical editors with internal technical *writers* and, more especially, with internal "data analyst-writers" ("technical ghost writers"). In some organizations, especially smaller ones, the same men hold more than one of these positions. All three are basically intended to serve a common purpose—to improve internal technical communications[4-6].

To clarify the situation, at least as regards internal technical editors, it seemed timely to make a current quantitative review of actual practices and beliefs, to determine more exactly who is and who is not using technical editors, how successfully, and why or why not. It seemed timely, also, to get more information about the editors themselves—their backgrounds, duties, and status.

Accordingly, I sent a questionnaire on the use of internal technical editors to about 265 organizations in the chemical, petroleum, aeronautical, and electronic industries, plus a few Government agencies and research institutes. Nearly half of these—129—replied before my deadline for tallying answers. Several answers were received thereafter.

So that there would be less ambiguity in these replies, I sent the following specific definitions with the questionnaires:

Technical Editor: Responsible for either expediting or managing the writing and production of reports and papers of the types desired by management, in the forms and styles agreed upon. Edits rough drafts prepared by the technical men themselves—before, during, or after supervisory review, as desired. May coordinate illustrating, proofreading, printing, and initial distribution. May prepare or coordinate style manuals and technical-writing courses. Through these and editorial conferences, engages in employee development.†

Technical Writer: Writes technical reports and articles for specific audiences, usually based on existing reports and on information obtained directly from personnel involved. Typical documents may be highlights of research progress reported by many groups, slanted for management information; over-all status reports; and technical papers or chapters of books, where expedient. May do occasional technical-management ghost writing.

Data Analyst-Writer: Writes technical reports and papers as needed, based directly on laboratory records of other scientists and on conversations with them, thereby relieving operating scientists of direct reporting responsibilities. Sometimes called a "technical ghost writer."

I also included an early abstract of my paper which gave added information on what an internal technical editor might do and might accomplish. Wherever possible, I included check-off lists of possible answers to questions—types of documents edited, editorial duties, qualifications, reasons for editing programs, accomplishments, problems, etc., also allowing places for "other" answers.

Before we look at answers, however, we must be quite clear about the preceding definitions, since continued confusion would influence our analysis of findings. Also, we must understand that while the focus here is on technical editors, technical writers and data analyst-writers play important roles of their own; the definitions attest to this.

Data analyst-writers are usually employed by organizations whose work demands scheduled output of many highly technical documents. They must be top-quality technical men, equal or superior in training and ability to the men whose data they report. Some organizations

*Paper presented before the Division of Chemical Literature, 137th National Meeting of the American Chemical Society, Cleveland, April 6, 1960.

†Inadvertently omitted but correctly construed as included by most respondents was "May edit technical house organs or journals."

have theorized that their use for most technical reporting would free other technical men for more research or operations, but many fear that this would also deprive the latter of the mental discipline and other benefits that accompany analysis of their own findings and that some information (blind avenues followed, unrelated but important findings, etc.) would be lost. It is this antipathy that seems often to be extended to internal technical editors, whose work properly begins only when the staff man has reduced his thoughts and data to a first draft, and to internal technical writers, who properly write documents intended for highly specialized uses (requiring special writing skills and knowledge).

BASIC CHARACTERISTICS OF RESPONDENTS

The organizations that answered the questionnaire included: chemical, 64; petroleum and natural gas, 24; electrical and electronic, 18; aeronautical and space, 7; Government agencies, 6; atomic research and power, 5; research institutes and consultants, 4; and others, 5.

Almost all branches of the chemical industry were represented. Respondents fell into the categories of organic chemicals, 17; pharmaceuticals, 14; plastics and fibers, 12; inorganic chemicals, 5; agricultural chemicals, household and related specialties, pulp and paper, rubber and synthetic rubber, 3 each; carbon black, fine chemicals, glass, textiles and textile chemicals, 2 each; and other and miscellaneous, 12. Most of the "petroleum and natural gas" organizations are "chemical" in the same sense as others tallied under that category.

Of the 129 organizations whose returns were tallied, 60 employ technical editors and 69 do not. Technical writers were employed by 54, but only 11 organizations (chiefly chemical and electronic) reported that they use data analyst-writers.

The questionnaire revealed that organizations using technical editors have an average of slightly less than 3, serving an average of 270 technical people. This finding that the average editor serves about 90 to 100 technical people substantiates fairly well an editorial rule of thumb of 75 to 100. If cost were the only criterion, it means that about a 1 percent improvement in staff efficiency would pay the salary of a technical editor for a staff of this size.

Fifty-two of the 60 editor-using organizations have full-time technical editors. Of these 52, four also use part-time editors and one also uses a consultant. Eight companies use only part-time editors.

Interestingly, nearly half (28) of the organizations using editors have them report to technical-information divisions; others mention technical-publication groups (8), research supervisors (7), research directors (6), heads of service groups (4), and others (13). A survey made in 1958 indicated that 22 percent of technical-information divisions edit reports.[7]

EDITORIAL DUTIES

As to the documents which technical editors actually edit, papers were listed by 54 respondents; reports by 45; proposals, 13; manuals, 9; brochures, 8; speeches, 7; bulletins, 6; and articles, 5. Since only technical papers and reports were specifically suggested by the questionnaire, it is possible that more groups would have checked other documents if they had been suggested. Many other documents were listed by less than five respondents: abstract bulletins, administrative orders, advertisements, correspondence, data sheets, handbooks, house organs, journals, labels, memoranda, news releases, patent disclosures, sales literature, and translations.

Preparation of technical manuals was considered technical writing in terms of this study. However, the supervisors of technical-manual writers properly considered editing to be one of their major professional duties.

Table 1 shows what the 60 companies using editors say that their editors actually do to the documents they process. The duties shown are those I suggested in the questionnaire; I may have stifled respondent analysis, however, since the only truly unique editorial duty volunteered was "legal review for copyright violations and misquotations." Checking the consistency and accuracy of nomenclature was mentioned, but most respondents probably included this under "Check accuracy of English usage." One respondent mentioned "Rewrite when necessary"—an editorial skeleton properly resurrected only under dire circumstances.

Table 1—Editorial Duties

Duty	Organizations requiring
Edit for readability	60
Check accuracy of English usage	59
Check for logical organization	54
Put documents in standard form	51
Supervise preparation of illustrations	42
Advise on planning and writing	40
Analyze for gaps in argument	38
Write style manuals	33
Handle report reproduction	33
Handle clearance of papers	27
Handle report distribution	23
Conduct writing courses	10

In doing their work, of course, editors don't scribble on documents flowing on an endless belt through an ivory tower. They work under management dictates

and in regular association with the authors of the documents they edit. Of the 60 companies reporting the use of technical editors, 36 make their editing mandatory, 9 make it optional, and 15 make it mandatory for some documents, optional for others. But the bogey-man of possible dictatorship apparently isn't involved; when asked "Who has the final authority over edited material?", only 7 checked "Editors." Most companies stressed that authors and editors normally resolve questions among themselves. If they cannot, authors usually retain the right of decision, at least on technical matters—this was mentioned by 19 respondents—or they share it with supervisors (in 11 groups), or they have problems resolved by supervisors and others in management (in 19 groups). Editors usually have the final say on at least "literary matters" and "company standards," however.

Not surprisingly, many technical editors spend part of their time doing other work—technical writing, documentation work, and such miscellaneous assignments as sales promotion, public relations, and supervision. It is probably safe to say that the average technical editor spends 15 to 30 percent of his time on such assignments and even more in smaller organizations where a full-time editor could not otherwise be justified.

EDITING-PROGRAM EVALUATION

In evaluating the merits of technical-editing programs, it is significant to learn that none of the 60 companies having technical editors report that they are considering abandoning these programs; and none say they would not begin them again if given the chance (one said it would do it slightly differently). Moreover, 24 companies say that they have evaluated their technical-editing programs quantitatively, but none of these report unsatisfactory findings for whatever their goals may have been. However, in reply to a different (qualitative) question, "Are you having any trouble in staff acceptance of your program?", 16 respondents (26 percent) answered in the affirmative.

As to actual goals, what were these organizations looking for when they started their editing programs, and how well are these goals being met? Table 2 shows their answers in terms of the goals suggested in the questionnaire—answers first to "Why did you begin using technical editors (please indicate order of importance)?" and then to "Are you satisfied that your editing program is . . .?" (followed by a list of the same goals). The answers speak for themselves; in every case but one, more companies are achieving specific benefits than had hoped to reap them. This is particularly true for savings in supervisor-editing time.

NONUSERS OF EDITORS

We can conservatively conclude, at this point, that those organizations which have technical-editing programs are rather well satisfied with them. What about the organizations that do not employ technical editors? First, let us look at how these are getting their editing done as compared with how editor-using organizations

Table 2—Editorial-Program Goals (in Rated Order of Importance)

Goal	Organizations citing	
	Reasons for program	Goals satisfied by program
Improve document readability	50	55
Get reports out on time	29	35
Reduce staff-writing time	24	32
Reduce supervisor-editing time	33	46
Get right info to right people	23	22
Improve staff-writing ability	20	28
Reduce publication costs	11	24
Get staff to write more papers	10	10
Reduce quantity of reports	2	3
Reduce need for oral reporting	0	8
Miscellaneous*	11	9

* Such as "Improve technical-publicity program," "Increase volume of reports (with growth)," "Streamline release of papers," "Give direction to technical-writing assignments," "Employee development," "Relieve authors of detail work."

Table 3—How Editing Is (Was) Done in Organizations Not Using Editors

Editing done by	Organizations	
	Not using editors	Now using editors*
Supervisors and/or management	47	25
(plus use of colleagues)	(7)	(6)
Colleagues only	2	0
Publication-review committees	3	
Librarians	2	1
Other	4	4
No exact plan	14	28

* Practices prior to acquiring editors.

got their editing done before they hired editors (Table 3). The only significant differences seem to be that more editor-using groups say they had no exact plan and that they put (or remember) less emphasis on supervisor editing.

Asked "Are you satisfied with your present 'writing' program?", only 24 of those not using editors said "yes"; 32 said "no"; 2 said "yes and no"; and 11 didn't answer. Asked "If 'No,' why not?", respondents checked the following reasons: reports not well written, 25; writing delays, 17; too much time consumed, 10; too few reports written, 10; too few papers written, 10; report distribution faulty, 3; and too many reports writ-

ten, 1. They added such other problems as "Report writing unpopular with bench chemists" and "Reports don't satisfy needs of nontechnical management."

However, most of these dissatisfied organizations are not considering using technical editors. To a direct question on whether they plan to use editors, only 7 said "yes," 54 said "no," and 8 nonusers of editors did not reply. A few "no's" added: "Not now." **But we're interestingly confronted with two groups—one which uses editors and seems quite satisfied with them and another which doesn't have editors, admits to having a "writing" problem, but doesn't consider editors the answer.**

Under these circumstances it is at least interesting if not completely enlightening to look at the answers to an "If 'No,' why not?" question asked immediately after the question: "Are you considering using technical editors?" These 43 answers may be grouped (phraseology is my own) under "management wouldn't approve," 18; "employee development might suffer," 9; "other ways are better," 3; "editors might create other problems," 3; and "other" 10. Incidentally, 19 out of these 43 respondents had said earlier that they were satisfied with their present writing programs; nevertheless, they cited other motives for not planning to use editors.

The reasons why these answers aren't too enlightening become apparent when we look more closely at them. The replies from the 18 nonusers of editors who feel that "management wouldn't approve" break down into "staff not large enough to justify (too little writing; too new)," 8; "cost would be greater (supervisory rewriting cheaper)," 5; "other problems more pressing," 2; "no space or allotment at present (management not yet concerned)," 2; and "no way to show payoff satisfactorily," 1.

The 9 noneditor-using respondents who feel that employee development would be hampered could be grouped as feeling that "writers gain by organizing own data," 4; "professionals should write own reports," 2; and 1 each feeling that "editing is part of supervisory responsibility and development," "loathe to provide a crutch for inadequate supervisory performance," and "adverse effect on authors." The 3 "better ways than using editors" that were cited included "conducting classes in report writing," "data analyst-writer would fulfill need better," and "supervisors, more familiar with contents, can assure correctly stated results." The 3 "other problems that editors might create" broke down into "they function chiefly as bottlenecks," "men of necessary scope and understanding would spend time better doing research," and "possible contributions don't balance added complexity."

Finally, the 10 "other" reasons for not using editors which were given by nonusers included 4 on "present writing and writers are satisfactory" (although 19 had answered a direct question on this affirmatively); 1 each on "wide variety of writer disciplines poses technical problem," "staff acceptance in doubt (may be too small)," "can't see how they would help get more reports written," "concept so new to the chemical industry"; and 2 replies that were nonpertinent.

Other than noting a lack of management support (based at least partially on the small size of certain organizations) and the fear that employee development might suffer (possibly still based in part on the confusion between editing and ghost writing), one can really draw few basic conclusions from these reasons, except that many are undoubtedly quite valid for the specific companies citing them. Indeed, whether an organization really needs an editor always depends on many factors, not the least of which are an understanding of what editors can and should do and a real desire on the part of staff and management to have them. If these are lacking to any extent, an editorial program faces an uphill fight.

STATUS OF EDITORS

Returning to the editor himself, we know now what he is supposed to do and that generally he is doing his work effectively. But what about him as a person? Is he a scientist or engineer, or a displaced English professor? Is he considered a full-fledged technical staff member and paid accordingly, or is he considered as a sort of clerical aide?

Table 4—Educational Qualifications for Editors

Degree	Organizations that		
	Require	Desire	Require or desire
Science	20	17	3
Engineering	8	13	2
Science or engineering	(8)	(12)	
Graduate	4	6	
			73
English	9	13	1
Liberal arts	5	5	
Journalism	2	10	
			45
Technical writing	0	11	
			11

I don't have direct data on the educational qualifications of present editors—I didn't ask for them—but I do have data on what organizations desire and/or require (Table 4). The crude totals shown at the right indicate that the majority of organizations want *technical* editors, but some apparently want *editors* for technical documents.

As Table 5 shows, most organizations want rather experienced people, although some of the years of experience in various categories could be gained concurrently. Incidentally, several organizations listed such other fundamental editing precepts as "ability to deal tactfully with authors" (four mentioned this) and "demonstrated writing ability." One hard-pressed company simply listed: "availability."

As regards salaries, to the question "Are the salaries paid technical editors comparable to those paid operating technical personnel with similar experience?", 36 answered "yes," and 11 said "no." Not unexpectedly, also, 6 of these 11 report difficulties in obtaining good editors. It is pertinent to note that 6 of the same 11 also require or desire English, journalism, or liberal-arts majors, who traditionally do not receive the equivalent pay of technical men. Interestingly, 4 of both "6's" are the same organizations.

Table 5—Experience Qualifications for Editors

Experience	Organizations that			
	Require	Desire	Require or desire	Years (average)
Technical	15	21		2+
Company	9	19	1	3+
Editing-writing	23	24		3

Table 6—Salaries Paid Technical Editors

Level	Average of replies	Range	Organizations reporting
Beginning	$5,500	$<4,000-8,000	24
Average	$7,100	$ 4,000-10,000	24
Top	$9,600	$ 5,000->15,000	26

The actual salaries paid are reported in Table 6. In reviewing these, we should know, however, that most of the editorial programs are not very old—about 7 years old, on the average, with 15 out of the 57 organizations which reported stating that their programs are less than 3 years old, and only 3 saying that they are over 15 years old. While no comparable data are at hand for salaries paid to operating technical personnel, it seems safe to say that editorial salaries are fairly comparable at present.

The survey did not go into the matter of career prospects for technical editors. These are somewhat clouded by the relative newness of most editing operations, and will certainly bear further study.

CONCLUSIONS

This paper has by no means exhausted the findings from the questionnaire, not to mention the results of an extensive study of the literature on technical editing which turned up over 40 pertinent references. For example, we haven't looked at the differences in editorial practices reported for different industries; a few examples are shown in Table 7. Hopefully, these will be summarized in later papers.

We *have* found that:

1. Technical editors are used in many industries—but to a greater extent, so far, in the aeronautical and electronic industries than in the chemical and petroleum.

Table 7—Some Differences Among Industries

Industry	Organizations using editors		
	% of respondents	And requiring or desiring technical degree, %	And having trouble obtaining good editors, %
Aeronautical and space	85	71	66
Electrical and electronic	77	17	64
Chemical	33	86	52
Petroleum and natural gas	33	75	25
All pertinent	47	75	55

2. Technical reports and papers are edited by most editors, but many other types of documents are edited by some.

3. Technical editors have many editorial duties, chief among them editing for readability, accuracy, logical arrangement, standard format, and gaps in the argument; supervising illustrations and report reproduction; and advising on writing.

4. The average technical editor serves nearly 100 technical men. He may also do some technical writing, documentation work, etc., especially in organizations too small to afford a full-time editor otherwise.

5. While technical editing by technical editors is often mandatory, authors and supervisors usually have the final say, at least in technical matters.

6. Organizations using technical editors report that they are benefiting from their programs—are accomplishing even more than they had anticipated in such important areas as improved document readability, report timing, reduced staff-writing time, and reduced staff-editing time. Editor-using organizations are ap-

parently unanimous in intending to continue their editing programs.

7. Many organizations which do not use technical editors are not satisfied with their "writing" programs but are not planning to add technical editors to their staffs. Chief reasons cited seem to be a lack of management support (partially based on the small size of the organizations) and the fear that technical editors would hamper employee development (partially based on the misconception that editors do ghost writing).

8. Most technical-editor-using organizations want experienced, technically trained editors. However, some want nontechnical men with strong English, journalism, or liberal-arts backgrounds. The aeronautical industry seems particularly to have the latter viewpoint.

9. Most technical-editor-using organizations now pay editors' salaries that are comparable to those of other technical men with similar experience.

10. Many technical editors are members of technical-information divisions. More report to these divisions than to any other single group.

Technical-editing programs can be beneficial to company programs and company men alike. Professional technical editors who possess adequate technical training; a good grasp of writing fundamentals, and fine points; an interest in working with people; and an understanding of management viewpoints are already in short supply. I predict that this shortage will increase, if and when more organizations realize the value of technical-editing programs. Ω

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About the Author . . .

B. H. WEIL *is Chief Editor of Esso Research and Engineering Company's Technical Information Division, in Linden, N. J. He is the editor of two books in the technical-communicating field,* Technical Editing *(1958) and* The Technical Report *(1954), and has edited a number of bulletins. He has also written several other books and nearly 200 papers on petroleum refining, petrochemicals, plastics, and communicating and documentation. He holds an M.S. in Ch. E. from the University of Wisconsin, following a B.S. in Ch. E. at the University of Missouri.*

Mr. Weil's previous positions include Manager of Information Services of Ethyl Corporation Research Laboratories, in Detroit; Head of the Technical Information Division at the Georgia Tech Engineering Experiment Station, in Atlanta; and Head of the Information Section of Gulf Research and Development Company's Chemistry Division, in Pittsburgh. Mr. Weil was a national director of TWE, and served a term as chairman of STWE's Constitution and Bylaws Committee. He is a past chairman of the ACS Division of Chemical Literature.

Anyone for Fame?

L. S. Eggleton

"You're a technical writer and know all about words and things," they said, "so how about writing up some publicity stuff on our new type TE42 servo-actuated pilot's hot air indicator?"

I accepted the cloak of literature with what I hoped was becoming modesty and endeavored to look as though I were just bursting with peerless prose. I didn't know, though, because I was pretty busy . . .

"It would be published in *Canadian Home Aviation Engineering* magazine," they urged insidiously. "Your name would be on it."

That did it. At last—fame, my name on the same pages (well, *almost* the same pages) as the legendary heroes whose articles I read each month. Who knows, that hundred-buck prize offered annually by the Canadian Aviation Writers Association might even be within my grasp.

THE MASTERPIECE TAKES SHAPE

So I started to write. My title, "How Do You Know You're Hot," could have qualified for *Time* magazine as an example of snappy journalism; my lead sentence was inspired; and my development of the theme would have caused an English professor's toes to curl with delight.

With a fine flourish I concluded my article. Clearly, there never had been such a masterly summation. For decades—until the oblivion of obsolescence overtook the type TE42 indicator—pilots in urgent need of data on climatic conditions in the cockpits of aircraft fortunate enough to be equipped with this device would carry, next to their trusting hearts, a dog-eared copy of the magazine containing my article.

Obviously, not a word or paragraph needed changing, but just to be on the safe side maybe Sales and Engineering *could* take a brief glance at it on the remote chance that there might be something—some last minute modification maybe—to make my text absolutely correct.

A week later my multilated draft limped back. Red-pencilled gashes showed where the cruel knives of Sales criticism had opened gaping wounds. Engineering attacks were more subtle—blue-pencilled areas, like bruises, marked the spots where their technicality bludgeons had battered the quivering remains.

Sales thought that my approach was "flippant, superficial, and no fine enthusiasm for the product shone from the lines." I needed more "sell"; the company's name only appeared three times instead of every alternate word as Sales would have liked.

ANOTHER VIEWPOINT

Engineering scornfully pointed out technical inaccuracies. I didn't say which of the current production models, the TE42-5-B or TE42-5-C, I was referring to, and in any case my illustration was of the TE42-1-A prototype which was obsolete. Also didn't I know that my system schematic showed the old vacuum tube servo amplifier whereas all current models had transistorized amplifiers? But, sneered Engineering, these faults were as nothing compared with the fact that the whole thing was obviously a Sales gimmick, had too much "sell," and was no better than a soap commercial.

Gritting my teeth, I reminded myself that a writer must be objective; he should regard all criticism, however unjustified, as manna from heaven. Maybe so, but I assured myself that this would be the last time I'd write a magazine article on a company product.

My ruined text was retyped and sent to the editor of *Canadian Home Aviation Engineering,* and I sat back to await the day of publication.

Some infinite wisdom has decreed that an author must always be the last person to receive a copy of his own work, but I managed to borrow one from the janitor and sat back to relish my own inspired words. I did not at first recognize my work in its truncated form; that illiterate fiend of an editor had not only tossed

my good title into the garbage but also cut out the best parts of my text.

I was through writing for technical magazines. I would become famous in other fields, and the editor of *Canadian Home Aviation Engineering* would come crawling to me to plead for a few words and I would laugh sneeringly. . .

Still, there *was* my name in print and that wasn't a bad picture of me on the biographical note at the front —next to a legendary hero, too.

A month later they came again. "You're a technical writer and know all about words and things," they said, cunningly. I knew it then: I was hooked. I must labor unceasingly henceforth for these insensate monsters, producing beautiful sentences for them to beat and tear with their red and blue pencils. Ω

About the Author . . .

L. S. EGGLETON *is in charge of publications at Aviation Electric, Montreal, where he has been employed since 1955. His writing career began in 1954 with Canadian General Electric in instruction manuals on radio communications. Since then he has published 14 articles in various Canadian trade magazines, as well as a piece in* Design Engineering.

Mr. Eggleton is a member of the Society of Technical Writers and Publishers and the Canadian Industrial Editors Association.

Writing is for Readers

H. R. Clauser

Reading is an indispensable part of written communication. To communicate, our words, phrases, and sentences must be read and understood. Writing that does not meet this requirement is noise.

It follows, then, that it is the reader's reception of our writing that measures the extent to which we successfully communicate our ideas; thus the reader is a proper and important person to study when we set out to improve our writing. So it is he, the reader, rather than you, the writer, who will be the principal subject of this article.

In recent years reading courses have become almost as popular as courses on how to win friends. And rightly so, for they can improve reading speed and comprehension. But in one way, reading courses are based on a partially false assumption—that is, that all writing is good writing and that writers are aware of the rules of good reading. We all know that this is far from being the case.

So, to help our readers and make it possible for them to practice what they have learned from reading courses, we should write in accordance with the rules of good reading. If we follow this practice, we will quickly discover that the rules also help us, the writers, for as it turns out, the rules of good reading are identical with those of good writing. Let's study the rules for effective reading.

READING AND WRITING WITH A PURPOSE

The following statement introduces one of the chapters in a course on reading: "When an author writes an article or a chapter, he has a purpose in mind for conveying his thoughts to others . . . When you are about to read a selection, you should decide what that purpose is, and adjust your reading to it." This is sound advice, and I'm sure many readers, whether or not they have taken a reading course, try to apply it.

But, unfortunately, readers are frequently double-crossed by writers whose writings seem to have no discernable purpose. Reading such writing is like retrieving a ball of yarn that is aimlessly rolling and unwinding on a patch of uneven ground. The reader does not know what to expect. He cannot determine the level or pattern of the thoughts or information the writer wants to convey. Consequently the reader may become discouraged and give up; or, having retrieved the unraveled ball of yarn, he may wonder why he did.

So, for effective communication there must be a definite purpose behind our writing to give it form and a sense of direction. To determine what this purpose is, we must ask these two questions before beginning to collect or select our material: What is it for? and Whom is it for?

Answering these questions will go a long way toward giving your writing a sense of unity and focus. There are often several answers to the questions. You may have several aims in mind. The solution, then, is not to ignore the questions and try to serve all possible purposes. Difficult as it may be, you must still arrive at answers that will define the purpose of your work for the reader.

There is another important reason for answering the foregoing questions. Writing with a definite purpose not only benefits the reader, but also helps you, the writer. As you will see later, it serves as the benchmark, the basic guide for your writing task. It sets the tone, the pace, and the technical level; it helps determine the amount of detail to be included; and it suggests how the writing should be composed.

READING AND WRITING IDEAS

One of the first things the students in reading courses learn is to read ideas and not just words. They are taught to master the art of searching for and quickly grasping the author's ideas.

The key to helping the reader in his search for our ideas is the paragraph. The principles of good reading

teach him that each paragraph viewed as a whole represents one and only one unit of thought or idea. So the writer should approach each paragraph as if it were the only writing before him at that moment, and it should be written with these two questions in mind:

1. What is the basic *subject* or thing I want to cover in this paragraph?

2. What is the important *idea* or thing about the subject I want to convey?

Paragraphs constructed using these questions as a guide will make it easy for the reader to spot the basic thought and to separate it from supporting, but often subordinate, detail.

In every piece of expository writing, there is supposed to be a hierarchy of ideas and subjects, and the student taking a reading course is taught to uncover that hierarchy and quickly pick out the main ideas. Thus, to help him in this task, our writing should clearly distinguish between the importance of various ideas we are trying to convey to him. There are a number of ways to do this. A well chosen title for an article, a report, or a memo can often give the reader at least a good preview of the principal idea or ideas covered. More commonly, the subheads can function as statements of either the main ideas or subjects and, at the same time, show the structure of the written piece. For example, in this article the subheads represent the major subjects covered. Other familiar methods are abstracts, summaries, and lists of major points covered. The accompanying box, for example, highlights the main ideas of this article.

HERE ARE THE HIGHLIGHTS

- In written communication, no one plays a more important part than the reader.
- The rules of good reading are identical with those of good writing. In terms of writing they are:
  1. Write with a purpose.
  2. Write ideas, not just words.
  3. Write paragraphs as units of thought.
  4. Highlight the main ideas.
  5. Include only relevant detail.
  6. Select amount and kind of detail to suit the audience.
  7. Relate detail to the main ideas.
  8. Permit conscious inaccuracy when it leads to better understanding.

A method not so common but which could be used more often to advantage is leading off each major section of the paper with a statement of the main idea. The idea can be emphasized by underlining it. In printed matter the main ideas can be set in boldface type, as is shown in Figure 1.

Here is a
comprehensive survey of

Permanent Magnet Materials

- *Magnet steels* • *Alnicos*
- *Other magnetic alloys*
- *Ceramics* • *Fine particle magnets*

by Robert J. Fabian, *Associate Editor, Materials in Design Engineering*

■ Permanent magnet materials can be used in a wide range of applications where a self-contained source of potential energy is needed. Their use ranges from simple door latches having a high holding force, on up to complex motor stators having a strong, inherent magnetic field. A great number of permanent magnet materials have been developed to meet the needs of such varied applications. The purpose of this article is to describe the various metal and ceramic materials that are available today.

In the past, the magnet steels described first below were the only permanent magnet materials available to the designer. Although they are still used to a limited extent today, they have been replaced in many applications by the newer permanent magnet alloys and ceramics which possess superior magnetic properties.

Magnet steels

are generally low in cost and are available in a wide variety of shapes and sizes. Although suitable for some applications, they are not used where high magnetic strength, small size or light weight is required.

At one time the magnet steels were the only permanent magnet materials available to the designer. Although they are still used to a limited extent today, they have been replaced in many applications by the newer permanent magnet alloys and ceramics which possess superior magnetic properties.

Figure 1—Highlighting the Main Ideas

READING AND WRITING DETAILS

Perhaps the most difficult part of reading and, likewise, of writing, is dealing with detail. Often it is relatively easy to set down the main ideas of a piece of writing. But when that has been done, writer's (or reader's) cramp frequently sets in. We either feel that there is nothing more to say, or we feel hopeless and indecisive in facing the mountain of detailed material before us.

In dealing with detail, our first concern is to avoid burdening the reader with unnecessary detail. Out of the mass of facts on hand, we must sift out that which is relevant. "What has this to do with it?" This is the question we must constantly ask because irrelevant details seldom do any good and may do some harm.

Indeed, one of the unkindest tricks the writer can play on the reader, particularly one who has taken a rapid reading course, is to suddenly present him with an isolated, irrelevant fact. In the paragraph below, the last sentence is such an isolated fact, with no relation to the rest of the paragraph. Examination of the entire article showed that it also had no connection with anything

else in the article. This example illustrates a particularly dangerous type of irrelevancy. Because "hardenability," the irrelevancy, in some instances could be related to the subject of "carbide content," the reader is doubly confused.

A further control of carbide content can be obtained by composition variations. The carbide content is increased by the addition of chromium or by lowering the carbon equivalent, and it is decreased by the addition of copper or nickel. *Hardenability is significantly increased by the addition of molybdenum or chromium and is moderately increased by the addition of copper or nickel.*

Sprinklings of such irrelevant facts through technical papers and reports is common in technical writing. Perhaps the most common cause is that most of us do some thinking as we write and sometimes even write in order to think. Therefore it is not unusal that, from the many associations generated by our thinking, some unwanted ones will drop unnoticed into our paragraphs. The cure is to seek them out when you revise and never to succumb to the temptation to write the way you think or talk.

HOW MUCH, WHAT KIND OF DETAIL?

Besides having to decide what is relevant to the subject about which we are writing, there are other problems to face. One of these is deciding the amount and kind of detail needed.

The amount and kind of detail needed to amplify our main ideas is closely related to the audience. Every field, every subject, consists of several stages of sophistication. And the stage that your audience occupies will largely determine the kind and amount of detail you can safely include. For example, in the general field of science, there are five stages of sophistication (see Figure 2), according to Bachelard in his book, *La Philosophie du Non*. The double lines separating the stages represent the real barriers that exist between stages, and when writing in the general science field, we must respect them.

Although it is relatively easy for a person in one stage to move to a lower stage and back again, it requires a good deal of effort to hurdle the barrier into the next higher stage. Thus, if the audience is largely in Stage 3, the detail you present must be largely of the Stage 3 variety or less. Or if you are addressing a Stage 4 subject to a Stage 3 audience, only a small amount of detail can be successfully communicated. And, according to W. M. Thistle,[1] to try to transmit any detail at all back through two or more of the stages is almost an impossible task.

What should be done when different amounts of detail are desired by various members of a mixed audience? Should the paper, report, or article contain practically everything—the laboratory procedure, the test set-up, the reasoning steps, the rejected alternatives, and answers to all questions or criticism that might be raised? If we include all such details in the conventional manner, we reduce the impact of our major findings and run the risk of losing important readers. On the other hand, if we omit some of the detail, we can be criticized for being incomplete or for not fully substantiating our findings.

It is a difficult decision to make. But rather than playing it safe and always including "everything," the problem should be faced each time we have a writing job to do. In many cases the problem can be solved by making use of appendixes. Another way is to treat some of the less important detail as optional reading. This is easily done in printed material by enclosing the optional reading in a box, as shown in Figure 3. When other methods of reproduction are used, the technique of optional reading is more difficult to apply. Nevertheless, it is still often feasible to insert boxes even in typewritten pages.

STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
Primitive Realism	Empiricism	Classical Science	Modern Science	Advancing Science

Figure 2—Stages of Scientific Sophistication

HOW ACCURATE THE DETAIL

Closely related to the amount and kind of detail is the question of how accurate detail must be when conveying ideas in one stage to readers who are in a lower stage of sophistication. Many scientists and technical men insist on maintaining the same precision in their writings regardless of the audience they are addressing. They would rather remain speechless than be caught describing high polymer thermoplastic fibers as resembling tiny corkscrews hooked together and arranged in parallel, intertwining rows, or referring to an edge dislocation in a crystal as being similar to a scar in the flesh.

But a certain degree of conscious or deliberate inaccuracy is necessary and permissible in order to make our detail palatable and understandable to other than

manganese steels, are water hardening. In general, tungsten steel magnets are forged, then machined to shape.

Chromium steels

Chromium magnet steels owe their development to the shortage of tungsten during World War I. As shown in the table (see next page), the maximum energy product values of the chromium steels are not as high as those of the tungsten steels. However, magnetic differences between the two materials are not appreciable and the chromium steels have the advantage of being lower in cost.

Compared to carbon steels, the tungsten and chromium steels are more stable after temperature changes and mechanical shock but, nevertheless, they still show some magnetic variations upon aging. Because of their high remanence the tungsten and chromium steels are useful for magnets requiring a small cross-sectional area.

Cobalt steels

The cobalt steels were largely developed in Japan where investigators found that additions of about 35% cobalt greatly increase the coercive force of steels containing 5 to 9% chromium and small amounts of tungsten. In general, an increase in cobalt content is accompanied by an approximately linear increase in coercive force and an increase in residual induction and maximum energy product. Higher coercive forces can be obtained with the cobalt steels than with the carbon, tungsten or chromium steels.

A wide range of magnetic properties can be obtained with the cobalt alloys within suitable composition limits. As shown in the table, manufacturers have established a number of standard alloys, the principal ones containing 3, 9, 17 and 36% cobalt. All of these alloys are martensitic and contain iron-carbon precipitates throughout the crystal lattices as a result of quenching from about 1475 to 1750 F.

Before the Alnico alloys were introduced, the 36% cobalt alloy was the best permanent magnet material known, the maximum energy product being 1.0×10^6 gauss-oersted. The alloy is still used today in a limited number of applications; however, it is relatively expensive for the amount of energy that it produces.

How Permanent Magnets Behave

In order to design a permanent magnet that will perform a given function, the designer must have a basic understanding of how ferromagnetic materials behave. The following description, supplied by Indiana Steel Products Co., explains how the magnetic properties of materials are obtained, and explains their significance.

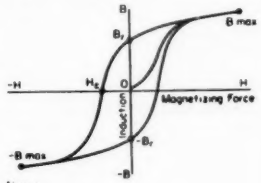

Fig 1

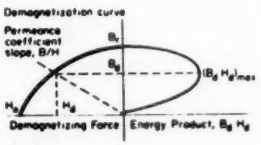

Fig 2

Understanding the hysteresis loop

Fig 1 shows how the induction in a magnetic material changes as the magnetizing force is varied. When demagnitized material is subjected to a gradually increasing magnetizing force up to H_{max}, the induction in the material increases from zero to B_{max}. If the magnetizing force is then gradually reduced to zero, the induction decreases from B_{max} to B_r on the vertical axis. This B_r value is known as the residual induction.

If the magnetizing force is reversed in direction and increased in value, the induction in the material is further reduced, and it becomes zero when the demagnetizing force reaches a value of H_c, known as the coercive force. A further increase of this negative force causes the induction to reverse direction, becoming $-B_{max}$ at $-H_{max}$. If the magnetizing force is reversed from this point to H_{max}, the change in induction is along curve $-B_{max}$, $-B_r$, B_{max}. This cycle gives the complete hysteresis loop.

Such a curve applies to all magnetic materials, the difference in materials being largely a matter of the values. Materials having a low coercive force are low-energy materials, and those having a high coercive force are high-energy materials. These are commonly known as soft and hard materials, respectively, but the terms low-energy and high-energy are more representative of the characteristics of magnetic materials.

Obtaining the maximum energy product

The section of the hysteresis loop from B_r to H_c is of major interest to designers of permanent magnets. This is known as the demagnetization curve and is shown in Fig 2. At the right of this curve is the conventional energy product curve, which is the product of B and H as taken from the demagnitization curve and plotted against B. The product of B_d and H_d at any point on the demagnitization curve indicates the useful energy produced per unit of volume. In the cgs system where B_d is in gauss and H_d is in oersteds, $B_d H_d / 8\pi$ is equal to energy product in ergs per cu cm. The external energy is zero at both B_r and H_c, and reaches a peak value at a point known as the peak energy product, $(B_d H_d)_{max}$. This point represents the maximum external energy that can be produced by a unit volume of a given material. It is a criterion for comparing different permanent magnet materials. Furthermore, in the case of fixed air gap applications the design which causes the magnet to work at the maximum energy point will require the least volume of magnet material.

Figure 3—Detail as Optional Reading

our wise and knowing colleagues. In an editorial in *Science* some months ago, Warren Weaver[2] proposed the idea of "communicative accuracy" to gauge the degree of inaccuracy permitted in scientific writing. He suggested: "A statement may be said to have communicative accuracy, relative to a given audience of readers or hearers, if it fulfills two conditions. First, taking into account what the audience does and does not already know, it must take the audience closer to a correct understanding. . . . Second, its inaccuracies (as judged at a more sophisticated level) must not mislead, must not be of a sort which will block subsequent and further progress toward the truth. Both of these criteria, moreover, are to be applied from the point of view of the audience, not from the more informed and properly more critical point of view of an expert."

HOW TO CONVEY DETAIL

Deciding the kind, amount, and accuracy of the detail is only half the job. We must still help our readers to read, comprehend, and remember the details we have decided to offer them. To tell us how we can do this, we again can refer to what is being taught to our readers in their better reading classes.

shell, these are the processes which will enable you to grasp and hold in mind a series of minor factual details."

Translating this reading rule into a rule for writing, we can say that each detail must be directly and intimately related and connected to its main subject or idea. This means every detail in its proper place. And its proper place is with the idea it is supporting.

A Because of the essential lack of atmosphere at orbiting altitudes, the heat transfer problems of satellite bodies are considerably different from those described for vehicles within the atmosphere. Free molecules which exist at altitudes of 100 miles or higher do not develop convective heating. Thus, the only significant heat transfer process involves radiation

B heating of the skin due to the solar flux. The thermal problem in this case does not primarily involve the structure of the satellite but the delicate electronic equipment which is the payload. For this reason the concern is with temperature changes from normal involving rather

A low values.

The primary external sources of heat to the satellite include the radiation from the sun and the reflected and emitted radiation from the earth and atmosphere. By far the most

B important parameters of the structure are the emissivity and absorptivity of the skin. High polish may be used to give a high value of reflectivity and thereby a low value of absorptivity. Another approach involves the plating of a light metal shell with a material of high

C infrared reflectivity covered by a transparent layer having a hard surface which would be resistant to meteoric dust. A low value of absorptivity generally signifies a low value of emissivity. This condition presents a problem if internal heating is developed by electronic equipment because of the difficulty of radiating the internal heat. An alternate procedure would be to rely on high emissivity and adopt spinning techniques to continually rotate the position of radiation heating to a position of radiation cooling.

As the satellite revolves about the earth, it passes from the earth's shadow into sunlight and back into the shadow again in periodic fashion. If the reflectivity and emissivity values

B of the surface are not favorable, a low heat sink body may develop quite respectable temperature cycles. The peak temperature may exceed 1000°F on the sun face side and the base temperature may drop below -200°F on this same face. The earth face undergoes less drastic swings because it never sees the sun in full incidence of its rays and it always sees a relatively warm earth even while in the shadow region. A spinning body, or a body of high reflectivity, may develop very mild temperature cycles. The Explorer satellite, for example, is a low deflectivity, spinning type, while the I. G. Y. satellite depends on high reflectivity. Possible abrasion by meteoric dust would be expected to be critical for a high reflectivity type, leading potentially to its destruction by melting for the case of a light metal skin. The spinning type should not be as sensitive to such abrasion.

C From a materials viewpoint it is obvious that a lightweight metal may be expected to serve as satellite material. However, depending on the design, surface treatments are required to ensure either high reflectivity or absorptivity values which are an absolute necessity for the protection of electronic components as well as the body itself.

Figure 4—Confusing Organization

One of the important techniques they are taught is to relate detailed facts to the main ideas to better understand and retain the detail. Nila Smith, a leader in the field of reading instruction, puts it this way: "As you read, think of the main idea as a magnet drawing the particles toward it—the 'particles' being the smaller and detailed ideas. Then visualize the main idea together with its cluster of subideas as a unit in itself. In a nut-

To emphasize the importance of this rule and also to summarize many of the points covered in this article, there is reproduced in Figure 4 a small section of a long article in which the author has failed the reader.

In reading this piece of writing, even the brightest readers would have difficulty, first, in sorting out the main subjects and ideas, and second, in associating the details with the main ideas. But those willing to take

time, after some study would see that there are three major subjects and ideas covered:

A. The thermal problem encountered in satellites. The thermal problem involves protecting the delicate electronic equipment from three sources of radiation heating—the sun, the earth, and the atmosphere.

B. The properties of the materials and surfaces involved in these problems. The satellite skin must have high reflectivity and low absorptivity to protect the payload from radiation heating.

C. The materials and surfaces used to solve the thermal problems. A lightweight material whose surface is treated to provide high reflectivity and low absorptivity, and to resist abrasion from meteoric dust, seems to offer the best solution.

In Figure 4 the details on each of the three main subjects (labeled A, B, and C) are scattered throughout the section. Although this piece of writing could profit by considerable revision, its readibility would be greatly improved by merely relating the details to the main ideas.

CONCLUSION

Writing, as we have been told many times, is one of our most important tools. Much of what we do has little importance until we can communicate it to others.

As this entire article has tried to show, the reader is the most important consideration whenever we write. We cannot expect him to organize our thoughts and put them in the right order; to sort out the relevant details; to relate the detail to the main ideas; and to translate our vague language into correct ideas. As we have seen, even with the best writing, the reader must work to get our ideas from the printed page. So let's ease his job as much as we can by practicing the rules of good reading when we write. Ω

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About the Author . . .

H. R. CLAUSER *is Editor of* Materials in Design Engineering *and has been associated with the magazine since just prior to World War II. He graduated from the University of Michigan, School of Engineering, in 1940. In 1940 and 1941 he was in charge of radiographic inspection and physical testing in the welding department at the Milton Plant of the American Car and Foundry Company (now ACF Industries). Following this, he joined the staff of* Materials in Design Engineering. *During World War II he served as an officer in the Army Ordnance Department at Aberdeen Proving Ground. There he was Chief of the Radiographic Section, Armor Branch, Ordnance Research and Development Center. After the war, he returned to* Materials in Design Engineering, *where he has served as Associate Editor, Managing Editor, and now Editor.*

He is a member of the American Society of Mechanical Engineers, Society of the Plastics Industry, American Society for Metals, American Society for Testing Materials, American Welding Society, and Society for Nondestructive Testing. He has published over 50 articles on engineering materials and related subjects and is the author of Practical Radiography for Industry.

Shop Talk and Technical Writing

William T. Battrick

There are decided differences between spoken and written English. We learn to talk early, and keep on talking. While we talk, we notice the listener's answers and other cues as well in order to learn how well we are communicating. Inflections, tones, pauses, facial expressions, gestures, and other aspects of verbal behavior make such conventions as punctuation, completeness of statement, connectives, exactness of vocabulary, and grammatical correctness unnecessary.

On the other hand, we write little. The average person may write fewer words in a year than he speaks in a week and rarely does he practice writing. While we write, we have no cues about how well we communicate; we have no audience and seldom visualize one carefully. In addition, we make constant use of conventions which are not very familiar to most of us because we never use them in talking.

COMPLICATIONS OF WRITING

These differences show that writing is harder work for most of us than talking—in practice, if not basically. English is an extremely rich, flexible language, in both vocabulary and idiom. Richness and flexibility make fine distinctions possible but complicate writing by increasing the number of ways of stating an idea.

As we learn continually, some ways are more effective than others. In this fact lies a big difference between talking and writing. As children, we learned the value of communication; so we set about learning to talk. By trial and error and knowledge of results, we learned to think of words as tools and to restate an idea as many times as it takes to communicate it.

Few writers ever adopt the talker's attitude and technique. Yet both are essential for anyone who is trying to write effectively. The first phase of the technique is simply to use shop talk in drafting a report.* (1) Imagine you are talking about your work—say an experiment. (2) Regard the listener as a challenge for you to verbalize precisely. (3) Restate the group of facts until the imagined listener understands. (4) Keep the statements which seem most likely to communicate. (5) Give the elements of the statements a logical arrangement.

THE TALKER'S ATTITUDE

Suppose we illustrate this process. Imagine, if you will, an experimenter talking about a study in detecting targets lighted by a tank-mounted searchlight:†

"The further you go from the searchlight—I mean the observer—the more liable you are to see the target —in the beam. You see, backscatter makes it harder to detect, more so if you are in the tank—the carrier tank. . . .

"I suppose there are limits; theoretically detectability increases the further you go—out from the tank, even around toward the target, if you don't go too far. We did pilot work that shows backscatter gets less, to 200 yards—on a tangent, if you think of the target as a center and the searchlight on the circle. You could go out this tangent, or around the circle to 45 degrees, and the probability an observer will see a target keeps increasing. But we didn't want him more than 160 yards off—at night he can't be too far from the tank if they want to coordinate—and there may be brush out there between you and the target. . . .

"You see we consider backscatter, tactical coordination, and obstacles between you and the target. Backscatter decreases as you go out—and detectability increases—up to 200 yards, theoretically further. But out a ways he loses contact with the tank, and may not see much for terrain in some combat situations—not on this range anyhow. . . .

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*This technique may be applied to writing of any kind. It is perhaps most useful in handling material which is strictly utilitarian.

†In inventing this talk, no effort was made to visualize the talker as adept or inept; the level of usage is arbitrary. It is assumed that he has already defined backscatter—the reflection of light back to the searchlight source by dust and moisture—and that he will go on to specify the observer locations.

"What we did is put men out and turned the light on —out as far as it's practical—and compared what they saw, to find out the best distance to put them. You displaced them because of backscatter, but not so far they lose contact and maybe won't see much. We wanted to avoid backscatter and still coordinate. . . .

"See now? We put a searchlight on the tank, and put men looking for targets along the firing line, and turned it on. We wanted to find out the best observer position, so far as detecting a lighted target was concerned, considering backscatter and tactical coordination and maybe terrain obstacles."

In talking over one aspect of his study, an experimenter may say as much or more. Saying it is economical. (1) It takes about 120 seconds, including 30 for pauses and replies. (2) In a sense, words vanish as he talks, and require no defense. (3) He constantly responds to the challenge of having a listener—implicit in every sentence is a criticism or revision of the preceding one. (4) By the time he is through, he has said what he meant to. Indeed, he will not stop talking until he has, for he knows his listener is waiting for a fairly precise formulation.

IMAGINARY SHOP TALK

A technical writer may jot down all his imaginary shop talk, to have the statements to choose from.* Or he may merely imagine the statements by which he finally reached his listener, writing down only the one he means to use. He of course sees that he must not write anything five times, even in a first draft. The reader is free to look again and again at a statement. If it is really effective, he will have to look at it only once. In writing we have to give a reader the impression of a logical flow of ideas—without wasting his time. What a reader does in 120 seconds is read a page or two, fifteen sentences at least, each containing a group of related facts and ideas. In this sense, writing is even more economical than talk.

The writer, realizing that he must not write as he talks (except within limits), will know that he has to face problems of verbal precision as the talker rarely has to. So after choosing his imagined statement, he usually puts its elements in logical order and adds connective words to make his arrangement clear.

What he puts on the page may look like this:

To allow for the effect of backscatter, which previous pilot work indicates decreases as observer displacement from the tank increases (at least to 200 yards from the tank), and to allow for both the effect of observer distance on tactical coordination between observer and tank and the effect of terrain features on target visibility, observers were stationed at intervals lateral to the tank, the farthest man 160 yards from the tank, and their effectiveness in detecting targets illuminated by the tank searchlight was compared.

If he writes as well about each aspect of his work, his draft will be fairly good. But in a first draft of any group of ideas, he may not achieve this degree of formulation, even after 20 minutes of concentration. It could be longer, if he has not thought at least briefly in terms of what he would say to a listener (if he had one). Facility in writing is rare, even in the highly educated. A gifted, practiced writer may be found revising on his deathbed. If we concede that formulation takes time and labor, we find the problem easier to face when we realize that shop talk offers us a technique which produces effective writing and that anyone who thinks well will write well—provided he goes to enough trouble.

The writer is not through with the technique—by any means. He has applied only the first phase. The second phase consists in revising the draft—more than once—keeping four things in mind: (1) Once spoken, words are gone! once written they are distressingly immortal. (2) Shop talk has virtues—directness, force, informality—worth keeping in the written version. (3) We write for an audience, though we write only when we are unable to reach an audience by talking. Hence readers who comment extensively on the draft are essential to a writer, being the equivalent of a talker's listener. (4) The difference between ear and eye as receptors is crucial in revision work.

EYES VERSUS EARS

A reader's visual expectations differ from a listener's auditory expectations. The ear accepts the shop talk with all its defects; for the ear hears more than words and the listener watches the talker. But the eye never expects to see shop talk in print—indeed, it will not put up with defects like these in any writing:†

1. Needless repetition; excessive wordiness.
2. Loose and imprecise statement.
3. Ambiguities (". . . he can't be too far from the tank if they want to coordinate. . . .").
4. Faulty diction (*liable* for *likely* or *apt*).
5. Failure to structure material to emphasize and subordinate ideas.
6. Interruptions (digression, interpolation).
7. Shifts, for example in person and tense (*him, you; could, will*).
8. Defective logic (". . . looking for targets along the firing line. . . .").
9. Not making relationships between ideas clear—omitting a connective or using the wrong one.
10. Poor sequence of ideas.

*It may be useful to record and listen to the talk.

†The reader will usually stop reading such writing, though he may not realize exactly what the defects are.

Shop talk is full of these defects (and others); the ear accepts them, though it is not necessarily less critical than the eye, or less adept at noticing errors, perhaps only more used to ignoring them. The eye rejects them in writing because visual symbols are the reader's only cues—as the writer realized in writing his draft and as he must keep in mind in revising.

Suppose we revise his draft. What are its defects? He or his readers may notice most of these:

1. The sentence is too long for visual comfort. Neither substance nor quality will suffer if he makes two sentences of it, and the reader's eye will be grateful.

2. He has not mentioned the observer in the tank.

3. There is some awkwardness (". . . which previous pilot work indicates decreases . . .").

4. One statement is illogical. (". . . their effectiveness will be compared.")

5. At least one phrase, *observer displacement,* is needlessly technical.

FINAL DRAFT

If he persists in recalling the expectations of both eye and ear and in regarding words as tools, the writer tries to turn these criticisms to the reader's profit:

> Pilot work has shown that backscatter is greatest at the searchlight source and that it decreases as observer distance from the carrier tank increases (to at least 200 yards from the tank). But at night, coordinated tactical action is reduced, if observers are far from the tank; also, on the range and in combat, terrain features may interfere with target detecion by observers stationed more than 160 yards from the tank. So observers were stationed in the tank and at various distances from it (in the lateral plane), the farthest at 160 yards, and their effectiveness in detecting targets lighted by the searchlight was studied.

In this version he supplies the missing observer, improves readability (by shortening sentences), improves logic, simplifies diction, and avoids awkwardness. But when he studies this version and the comments by his readers, he realizes that he has overelaborated, included an irrelevancy, and introduced new defects.

1. Why mention 200 yards, except in a note? (He did not use this distance in the study.)

2. Only one tank is mentioned; to use *from the tank* three times is unnecessary.

3. When they read *searchlight, tank,* and *tactical action,* most readers will guess that range work is going on at night, and that conditions which are likely in combat are being considered.

4. *In the lateral plane* is of little help in visualizing the observers. Some readers will guess that the observers are not retreating or advancing; *along the firing line* will help every reader visualize them accurately at once.

5. ". . . their effectiveness . . . was studied" is weak.

As long as he maintains the talker's attitude, the writer will call such comments knowledge of results, and will keep on revising until he has a version like this:

> Backscatter, greatest at the searchlight source, lessens as an observer moves away from the carrier tank*; but as he moves, coordinated action between tank and observer is increasingly difficult, and terrain features may interfere with detection. In this study, observers were stationed in the tank, and at intervals along the firing line out to 160 yards; their performances in detecting targets lighted by the tank searchlight were compared.

This version is reasonably exact, complete, and clear. It has incidental merits: It is relatively brief; it is conversational, easy to read, simple, direct, and fairly forceful. The writer has solved a problem in communication for readers of utilitarian prose, readers who want the most information in the shortest time. Having adopted the talker's attitude—that his material is a commodity and that communicating it is his business—the writer has restated it, revising in terms of a reader's visual expectations, as the talker always does in terms of a listener. Perhaps exhausted by now, he is also beginning to understand Eliot's acceptance of the writer's job: "For us there is only the trying." Ω

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*Note about pilot work—decrease in backscatter, increase in visibility, out to 200 yards from the tank.

About the Author . . .

WILLIAM T. BATTRICK *is editor at the U.S. Army Armor Human Research Institute, Fort Knox, Kentucky; the unit is a field facility of the Human Resources Office of George Washington University. In addition to his seven years in his present position, Mr. Battrick's experience has included teaching of English and speech at the University of Colorado. He has also taught English, mathematics, and science in the high schools of Ohio. Mr. Battrick is presently teaching an evening class in literature at the University of Louisville.*

Instant Words for Engineers

John E. Gregory

The Savannah River Plant is part of the atomic energy industry—an industry whose rapidly expanding technology generates new words as easily and almost as rapidly as it splits atoms. This is an account of how the editorial group of the Savannah River Plant harnessed that rather awesome propensity for word multiplication and used it to capture the interest of report-writing engineers.

Engineers welcomed the publication of a Word List that helped them with terms like *boattail, dog-boning,* and *rooftop ratio.* This Word List is not a rule book. It simply has terms whose spelling, capitalization, hyphenation and usage can be looked up quickly by the engineer, who can then get on with his work. But it also has brief, clear-cut descriptions of *why* words are used in certain ways.

The Word List rapidly became a favorite tool, and gradually its "lessons" took hold, were absorbed, and—most gratifying of all—were reflected in an improved quality of the reports submitted for editing.

AUTHOR-EDITOR RELATIONSHIP

The editorial group at the Savannah River Plant serves some 200 engineers whose work involves technical assistance to manufacturing operations. Activities of these engineers range from instrument development to nuclear reactor maintenance and improvement. As a rule, each engineer writes technical reports only occasionally. His reports are usually for a local audience, but sometimes he prepares an external report of the research and development type or an article for journal publication.

An engineer's report is reviewed by his immediate supervisor for technical adequacy and is then sent to the editorial group for editing, reproduction, and printing. The supervisor usually does some personal "editing" of the rough draft report and also makes certain that the report complies with company policy. This supervisory attention really constitutes the principal report training of the engineer, and since there are a number of widely scattered groups of engineers, the depth of such training varies widely.

New engineers are exposed to an introductory 4-hour writing course which they receive concurrently with other orientation material. But this is the only formal report training they get. Dispersion of personnel over a large plant, diversity of engineering interests, a feeling that only experience can yield good report quality—these factors have all tended to limit formal training. It was against such a background that the editorial group had previously issued a writing manual and detailed bulletins of instructions. These instructions were of some help, but they weren't truly successful because they had to be studied, and engineers just didn't find time to study them.

ANSWERS FOR ENGINEER'S QUESTIONS

Then we decided to gear our author aid (or training) to a different concept. Engineer-authors wanted help. We were asked a great many questions, but not very many different *kinds* of questions. Mostly, they had to do with words and word usage. Perhaps the best type of assistance pamphlet would be one that didn't require study but which quickly answered the engineer's questions. So we issued a Word List that is carefully tailored to the puzzling word usage questions we'd been asked, and we buttressed the list with short descriptive material that tells *why* words are used in certain ways.

The Word List has been a success. It has generated a real interest in word usage—an interest that has expanded into other avenues of good writing.

A DESIGN FOR WORDS

The Word List is a thin pamphlet with two-column 8½- by 11-inch pages. We addressed each engineer's copy to him individually, writing his name on an illustrated notice slip (Figure 1). We tried to capture the attention of the engineer with this introductory gimmick,

but we didn't make the Word List a joke book filled with cartoons. The pamphlet itself simply tells the engineer what he wants to know in a direct, straightforward manner.

Basically, the Word List is an alphabetical listing of terms, including abbreviations. Many of the terms are designated (N), (A), or (V), to show whether they're used as nouns, adjectives, or verbs. For example: *leak test (N), leak-test (V)(A).* In compiling the List, we tried to narrow the field to those terms which are:

- Handled at our plant in an unusual manner because of their specialized local usage.
- Treated differently by different local writers.
- Disagreed on by different reference books.

We concentrated on the unusual plant or laboratory terms which had become necessary parts of the engineer's vocabulary but which were so new or unaccustomed that spelling, capitalization, and hyphenation were problems. We also sprinkled the list liberally with those standard terms which are apt to be difficult to spell or troublesome to convert to the modifier form.

SPECIFICATIONS FOR SELECTION

Here are the major categories covered in our list of some 800 terms.

Spelling. Some terms, such as *planchet,* are listed to show how they are spelled. Included in this category are a number of trade-mark names, such as *Lectrodryer and Fiberglas,* which—understandably enough—are misspelled by many writers.

Capitalization. Some terms are listed to indicate whether or not they are capitalized. *Disassembly Area* is the recognized name of a specific major production area and hence is capitalized; *disassembly basin* is merely a descriptive title for a process facility.

Names of instruments, equipment, and materials seem to offer engineers an irresistible urge to capitalize. In the Word List, we capitalize them only when there is a specific reason for doing so. In general, we specify capitals for trade-mark names, for terms which have a specialized local meaning *(Apple Picker),* and for terms which are proper names *(Raschig ring).* Capitalization of trade-mark names is not a problem, but sometimes it's hard to remember which terms are trade-marks. Some engineers are surprised to discover that *Calrod* and *Pyrex* are trade-marks, whereas *buna S* and *kraft paper* are not.

Process locations on a large plant have a way of developing a variety of names. The List encourages standardization and helps to restrict an overabundant terminology. For example: *Purification Area,* versus *purification section,* versus just plain *Purification.* We find that engineers, who perhaps hadn't previously given much thought to loose terminology, now appreciate this checkrein on wandering words; they know that if they follow the List their reports won't be misunderstood.

Abbreviations. Wherever possible, we adhere to the simplified style of abbreviation that is now widely used: same form for singular and plural, all letters lower case,

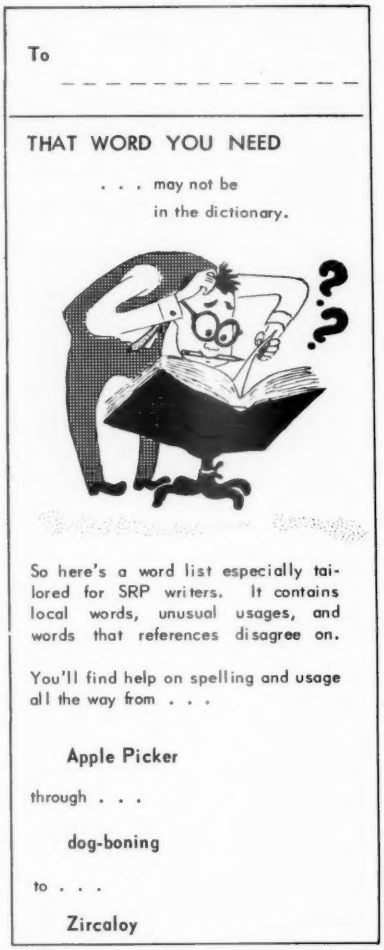

To
THAT WORD YOU NEED
. . . may not be
in the dictionary.
So here's a word list especially tailored for SRP writers. It contains local words, unusual usages, and words that references disagree on.
You'll find help on spelling and usage all the way from . . .
Apple Picker
through . . .
dog-boning
to . . .
Zircaloy

Figure 1—Tip-on Slip for Word List

and periods omitted. But we recognize that it is unrealistic to apply these principles indiscriminately, so the List includes several exceptions, such as *RDZ, RDZ's (Radiation Danger Zones).*

Hyphenation and Compound Words. Included in the listing are:

- Standard prefixes and suffixes *(inter-, non-, pre-, -like, -proof, -tight,* etc.). It comes as a surprise to many engineers that these are joined directly to most words without the use of hyphens.
- Unit modifiers *(air-operated, hot-press-bonded,* etc.), Special notes explain that *a small tipped slug* doesn't mean quite the same thing as *a small-tipped slug,* and go on to show the difference between *cutoff*

block (a block used in the cutoff operation) and *cut-off block* (a block which has been cut off).

- Other combinations whose form is dependent on meaning (Place the unit on *standby*, and *stand by* for instructions. *Seam-weld* the two components; check the *seam weld).* As with unit modifiers, we selected a comparatively small number of the more commonly used (and misused) combinations.

WHY THE WORD LIST HELPS

All items in the Word List (except local terms) can be found in standard dictionaries and references. But when an engineer's nose is being held irritatingly close to the grindstone because of that report that must be finished today, he rebels against taking time to look up an obscure or perplexing word usage. So the "instant word" he quickly finds in the Word List is a joy to him.

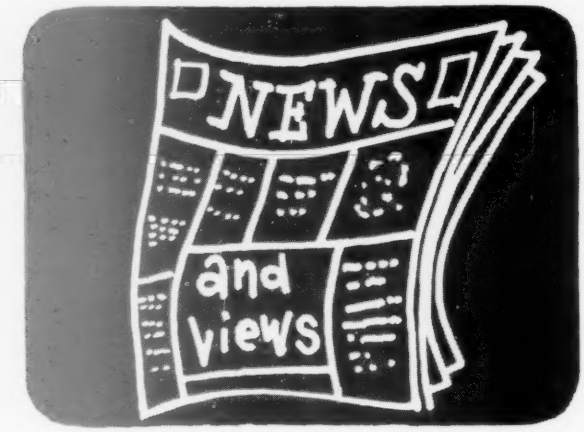
And then, no one wants to misspell; it's too noticeable. Ours is a new plant with new products that result in hordes of new words—words that are almost shoptalk in some cases, but very necessary for correct communication in a rapidly expanding technology. The engineer feels that he cannot display ignorance of the terms with which he must express himself. And so, again, the Word List proves a joy.

Consciousness of correct terminology and spelling leads to a greater awareness of those solecisms and barbarisms that formerly went unnoticed, and our engineer now finds himself in pursuit of good composition.

Of course, a Word List is no panacea—and certainly no substitute for the personal advice and assistance the technical editor gives to individual engineer-authors. But our experience does suggest that much good results when guidance in word usage is given to the engineer in a brief and palatable form. Ω

About the Author . . .

JOHN E. GREGORY *is Supervisor of the Editorial Group at the Savannah River Plant, Aiken, South Carolina, a production facility operated by the Du Pont Company for the U. S. Atomic Energy Commission. Mr. Gregory, who has headed this group since its inception in 1952, was a speaker at the 1956 TWE-STW Convention. He is a member of STWP.*



By A. Stanley Higgins

BIG BUSINESS IN PUBLICATIONS is described in a recent issue of *Barron's*. In the fiscal 1960 budget, about $2.8 billion (roughly 6 percent of the budget) was allocated to technical literature, according to the magazine. Titled "Money in Manuals," the article in the October 24, 1960, issue goes on to say that $1.72 billion of the allocation went to private enterprise.

The business picture for the technical publications firms has been improving over the past year, and prospects are good for continued growth. One company in particular has shown phenomenal growth: Miles-Samuelson's earnings, in the fiscal year ending last April 30, soared 272 percent to $66,592 on a rise in volume of 42 percent to $1.7 million.

Facts like these should be very convincing to prospective technical writers who have doubts about the future of the business — the big business — of technical publications.

A WEST COAST REPRESENTATIVE for the *Review* has been appointed by Editor Allan Lytel. He is Harry Squires, of Canoga Park, California. Mr. Squires will keep an eye out for manuscripts by members in that area, as well as for advertising. We hope that future issues of the *Review* can contain many more articles by our western colleagues than it has in the past. West Coast members who would like to aid Mr. Squires in his efforts are asked to contact him at Ramo-Wooldridge, 8433 Fallbrook Avenue, Canoga Park.

We are certainly happy to have Mr. Squires on the staff and look forward, through him, to much greater participation in our journal by the West Coast membership.

SAN DIEGO CHAPTER's Ralph De Sola is the author of *International Conversion Tables*, which is due to appear early in 1961. Published by Duell, Sloan, and Pearce, the volume will cover weights, measures, gauges, currencies, technical units, alphabets, and other data. Many of our readers are doubtlessly familiar with Mr. De Sola's *Abbreviations Dictionary*, which was published two years ago.

A recent issue of *Convairiety*, which is published by Covair in San Diego, contained an article about our well-known colleague. The following excerpt is from the article:

> De Sola's name is listed in the 1960 edition of *American Men of Science* with reference to his specialization in technical writing as well as work in allied fields. This is the second time he has been included in the "who's who" of men active in science. The 1933 edition carried his biography with special reference to his participation in the New York Zoological Society's Galapagos expedition.

RENTAL OF FILMS on communications may be of interest to STWP program chairmen. Michael J. Walker, of the Washington Chapter, sent along a list of 30-minute 16-mm films that may be rented from a Washington firm. He states that he has seen three of the films and thinks they are excellent.

The series, titled Problems in Communications, is composed of 50 different films grouped in four categories, all of which would be of interest to STWP members. The four categories are Talking Sense, The Quill (the art and craft of writing), Language in Action, and Language and Linguistics. As an example of the subjects covered, here are a few of the titles from the Language in Action group: Hiding Behind the Dictionary, How We Know What We Know, How to Say What You Mean, The Language of Advertising, Where is the Meaning?

For further information on this material, write Paul L. Brand and Son, 2153 K Street, NW, Washington 7.

PREPARATION OF PROPOSALS is the subject of an article being prepared for the *Review* by J. D. Cooper, Assistant to the Executive Vice President, Emerson Research Laboratories, Silver Spring, Maryland. Mr. Cooper reports that a literature search, as well as many personal inquiries, has revealed that comparatively little has been published on methods of developing technical proposals. Consequently he has requested that we solicit the help of our readers who are involved in the writing, editing, and production of proposals. If you would like to contribute to this effort, please get in touch with Mr. Cooper. By drawing on the experience of a number of proposal specialists, he should be able to produce a piece of real benefit to our readership.

(Continued on Page 27)

HOW TO COMMUNICATE POLICIES AND INSTRUCTIONS. Joseph D. Cooper. 348 pages. Washington: Bureau of National Affairs, Inc. (1960). $14.75.

This book covers the techniques of planning, writing, illustrating, and publishing written instructions of all kinds. It is an outgrowth of a volume titled *How to Communicate Policy and Procedure* published by the author in 1956. It is an almost completely new work in terms of emphasis, coverage, examples, and individual chapter treatment. While the earlier work was confined to internal administrative communication, the present one has been enlarged to embrace technical writing, consumer product instructions, training manuals, and miscellaneous information publications. The material on administrative communication has been updated and expanded with new examples.

The book is a good, up-to-date summary of sound procedures and modern techniques applicable chiefly within the somewhat specialized areas selected by the author, but applicable by inference to other types of written communications.

Part One of the work is devoted mainly to the techniques of planning, compiling, and producing loose-leaf internal policy, procedure, and job instructional manuals, with less emphasis on other types of internal company instructions.

Part Two covers a variety of expository writing techniques, aimed mainly at the description of step-by-step sequences for the assembly, operation, and maintenance of equipment ranging from consumer items to heavy industrial and military equipment. It includes a chapter on "The Literature of Training and Persuasion" that describes the production of training manuals covering job methods as well as such broader areas as improving one's spoken and written English. This same chapter discusses the building of acceptance of ideas and new attitudes in the mind of the reader.

Part Three covers the craftsmanship of written presentation involving organization of written material, how to write and explain, and the effective use of illustrations. Copy preparation and reproduction processes are covered in another chapter of Part Three. Five appendixes are included as exemplary material to supplement other examples in the main text. They cover: "How to Design and Use an Organization Manual," "Planning a Salesman's Manual," "Planning the Employee Handbook," "Planning the Purchasing Policy Manual," and "Planning and Production Check Lists for a Loose-Leaf Manual."

The author very capably points out the importance to the writer-editor of skill in human relations in handling communications problems with success and dispatch.

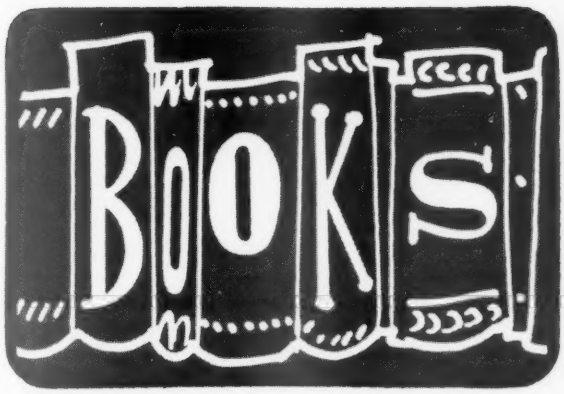
H. E. McGannon

SUCCESSFUL PREPARATION FOR F.C.C. RADIO OPERATOR LICENSE EXAMINATIONS. Darrell L. Geiger. 636 pages. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. (1960). $9.25.

The Federal Communications Commission issues both station and operators' authorizations for all types of radio activities. An FCC license is important to an electronic engineer, for it is a type of status symbol and, in addition, it is required for many jobs in the communications industry both for broadcasting such as AM, FM, or TV and for private two-way radio systems.

This book is written to help the reader in preparing for the FCC tests. In question and answer form it covers those questions which must be answered to obtain a commercial radio license. Complete in every respect, this book shows the result of long and careful preparation. There are several books on this same topic, but this is the most detailed and well written I have seen.

Allan Lytel



READABILITY: AN APPRAISAL OF RESEARCH AND APPLICATION. Jeanne S. Chall. 202 pages. Columbus: Ohio State University (1958). $4.00.

That readability research is difficult for anyone to appraise is apparent from Mrs. Chall's work. On the one hand, Mrs. Chall cautions against using readability formulas alone to predict the reading ease of written matter. The situation would arise where a certain piece of writing checks out at a given level by a formula, but is actually not understood by such a reader. On the other hand, the improvement in publications in the last two decades has in part been due to readability research.

The aim of readability research was a commendable one. Researchers sought to discover what distinguishes easy reading matter from hard reading matter. They tried to devise a reliable means to measure such factors. They also tried to set up grade levels indicating the reading ability required to read a given piece of writing.

The difficulty in appraising readability research arises because no one knows clearly what the readability formulas actually measure. Mrs. Chall presents statistics showing that most formulas measure what the analyst wants them to measure. In fact, they are merely measuring a few stylistic elements present in writing, elements such as word and sentence length. The formulas therefore do not reflect—and these aspects are rated very highly by experts—the ability of the reader, the strangeness of content, organization and logic, format, pictures, and other linquistic elements.

We may safely conclude from Mrs. Chall's appraisal that at best the formulas reliably measure how many long words and sentences are present in writing. Beyond this discernment, the formulas lack sufficient discrimination.

Do the formulas have any value beyond the junior high school level? Mrs. Chall is skeptical. Flesch's grade levels (easy, standard, etc.) are worthless because he fails to specify for whom the writing is easy or standard. On the upper levels, writing that Flesch would call difficult is conceivably easy for the scientist in the same field. Gunning's grade levels (10th grade, 11th grade, etc.) are therefore probably more realistic. No one can conclude, however, that Gunning's formula can actually predict a level because it does not take into consideration many of the factors affecting reading ease.

Editors are well aware that writing on all levels can be improved from the standpoint of clarity for the potential advantage of the reader without sacrificing accuracy. Furthermore, the technical writing-editing profession has reached the stage where it is now possible to communicate accurately and with depth most scientific subjects to the entire scientific community. Broadening the audience for communication is a major objective

of the profession. While readability research has not come up with the formula for successful, wider communication, the research has pointed up both the need for wider communication and some of the elements that bar wider communication.

Michael J. Walker

THE OTHER SIDE OF THE MOON. Issued by the U.S.S.R. Academy of Sciences. 36 pages. Translated from the Russian by J. B. Sykes. New York: Pergamon Press (1960). $2.50.

This book actually tells little about the other side of the Moon. The pictures shown are those that appeared in all the newspapers. Being an engineer myself, I would rather have seen a book on the calculations involved. This would have gone a long way toward proving to me if they really did what they claim.

A. N. Nesmeyanov, in his foreword to this book, says "The scientists of the Soviet Union hope that the publication of this work on the first photographs of the other side of the Moon will aid the onward advance of science to the conquest of the Universe." I doubt it.

Jerry S. Kelly

ENGINEERING ANALYSIS. Wen-Hsiung Li. 362 pages. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. (1960). $8.25.

Engineering Analysis is devoted to the application of mathematical theory to problems in physics and engineering, and to the solution of these problems in mathematical terms. Dr. Li's book is especially valuable because it lends life to mathematical theory which sometimes is construed to be without purpose. The student quickly realizes the extreme importance of mathematics as a means for solving problems. The reviewer was particularly impressed because the problems illustrated are characteristic of many fields — electrical, mechanical, structural, hydraulic, and many others. The earnest student of engineering easily becomes proficient in the derivation and solutions of equations for particular problems.

Chapter 1 deals with the applications of differential calculus; Chapter 2 discusses vector algebra. The applications of integral calculus are presented in Chapter 3; and ordinary differential equations and their applications are presented in Chapter 4. The final chapter is devoted to the important Fourier series.

C. M. Shekro

THE CELL. Carl P. Swanson. 114 pages. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. (1960). $2.95. Paper bound $1.50.

ANIMAL GROWTH AND DEVELOPMENT. Maurice Sussman. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. (1960). $2.95. Paper bound $1.50.

It is impossible to separate these two books. They are part of a new series known as the *Foundations of Modern Biology*, which is designed to provide the university teacher with a "do it yourself" kit for the construction of an elementary textbook. Although this reviewer doubts that such an objective will ever be completely fulfilled, this series should prove valuable to a teacher who wishes to supplement a textbook in those fields in which it may be weak.

One of the great difficulties of a series such as this one is the inevitable overlap between the smaller volumes, which may be avoided in a single integrated text. Thus Chapter 6 of Swanson's *The Cell* is called The Cell in Reproduction, and Chapter 6 of Sussman's *Animal Growth and Development* is called Cellular Differentiation. The two topics are not identical, but they are sufficiently close to make it doubtful whether a student should read both.

Animal Growth and Development is preoccupied with modern cell biology and bears very little resemblance to the classic texts of embryology, which lean more heavily on organogenesis. The vertebrate embryo occupies only a single chapter, and the whole of biochemical embryology is compressed into this chapter. Morphogenetic fields are discussed in the previous chapter, which deals with the life cycle of a typical coelenterate (Obelia). In fact, this volume of the series falls short of the promise of its title since it is far less concerned with animal growth and development than it is with cellular biology and genetics, each the subject of a separate title in the series.

The Cell is a better organized, better illustrated, and better written contribution. The first chapter, on the historical background, Tools and Techniques of Cytology, is a particularly useful contribution all too often omitted from contemporary texts. The next two chapters deal with the static cell and thus lead perfectly to a discussion, first of the cell in division, and then of the cell in reproduction and development. The last chapter on the cell in death is also a subject rarely covered in elementary texts. The author has been very skillful in his selection of illustrations, maintaining a balance between those diagrams that are necessary for understanding and those photographs that are necessary for appreciation of the structure of cells. This book could both excite a freshman college student and interest a casual layman in the basic units of living matter.

Peter Gray

THERMODYNAMIC PRINCIPLES FOR CHEMICAL ENGINEERS. Roger Gilmont. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. (1959). $11.00.

This book by Mr. Gilmont, written to fill the need of a basic textbook on thermodynamics for the chemical engineer, succeeds without a shadow of doubt.

Particularly, this reviewer liked the "group participation" concept for the solution of thermodynamic problems, the up-to-date discussion of the flow process, and the integration of fundamental concepts with the latest scientific findings.

It is my opinion that this book, which is very comprehensive and clearly written, will broaden the technical outlook of chemical engineers, scientists, and all other readers of thermodynamic principles in chemistry.

Jerry Kelly

INTRODUCTION TO ELECTRICAL ENGINEERING. Robert P. Ward. Third Edition. 372 pages. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. (1960). $8.50.

Reviewing this book has been a pleasure, since it brought back some pleasant memories of college days during which this reviewer had the privilege of using Professor Ward's Second Edition of *Introduction to Electrical Engineering*. Professor Ward's manner in presenting the material in this book is concise and clear, and the unrestricted use of diagrams is commendable. The student of electrical engineering, as well as others interested in science, will find this book most informative and valuable.

The book is intended as a transition between the fundamentals of electricity and magnetism taught in physics courses and the specialized courses taught later in the electrical engineering department. The fundamental electrical concepts and units are introduced as well as discussion of the laws of the electric circuit and networks. The next topic related deals with magnetic concepts, units, and the magnetic circuit. This is followed by presentation of the fundamental generator and motor laws wherein is discussed the correlation between a conductor carrying a current in a magnetic field and the force which is exerted

on such a conductor. Electric field concepts are derived, the conduction of electrical currents through liquids, gases, and semiconductors is covered, and a treatment is presented on transient response of simple circuits such as RL, RC, and RLC circuits.

At the end of each chapter problems are included which not only test the student's understanding of the subject matter but also introduce him to some actual design problems as they exist in the industry.

C. M. Shekro

NEWS AND VIEWS

(Continued from Page 24)

FREE PUBLICATIONS, as the supply lasts, are being offered to STWP members by Tom O'Neill, of Passaic, New Jersey. Three papers, "Technical Manual Writing," "Technical Copywriting," and "An Advertising Executive Looks at the Technical Writing Profession," are available, along with a worksheet, "Estimating the Complexity of Equipment for Technical Manual Writing." Mr. O'Neill's address in Passaic is Post Office Box 441. Better hurry; a limited number of copies are available.

FOOTBALL PLAYERS have long been subjected to jokes about their literacy. The following excerpt from the April 1960 issue of *College English* carries on that tradition. It is titled Letter from a Triple-Threat Grammarian.

Dear Sir; you never past me in grammar because you was prejudiced but I got this here athaletic scholarship any way. Well, the other day I finely get to writing the rule's down so as I can always study it if they ever slip my mind.

1. Each pronoun agrees with their antecedent.
2. Just between you and I, case is important.
3. Verbs has to agree with their subjects.
4. Watch out for irregular verbs which has crope into our language.
5. Don't use no double negatives.
6. A writer mustn't shift your point of view.
7. When dangling, don't use participles.
8. Join clauses good, like a conjunction should.
9. Don't write a run-on sentence you got to punctuate it.
10. About sentence fragments.
11. In letters themes reports articles and stuff like that we use commas to keep a string of items apart.
12. Don't use commas, which aren't necessary.
13. Its important to use apostrophe's right.
14. Don't abbrev.
15. Check to see if you any words out.

THE CONGRESSIONAL RECORD printed one of the speeches delivered at the last national convention of STWP. C. J. Dover's address, "Babel — A.D. 1960," was read into the June 6, 1960, *Record* by Representative Edwin B. Dooley (New York).

EDITORIAL NOTES

(Continued from Page 3)

There is also an economic as well as ethical and semantic responsibility in the use of language, and none of the three can be separated. In an AMA survey, it was found that the typical business manager spends half of his time handling paper — memoranda, agenda, letters, specifications, and reports of all kinds. This survey states that four-fifths of the reading time was wasted because "material was repetitious, unclear, poorly organized, late, and irrelevant."

The first step in semantics is a mental discipline that keeps meaning in focus, and commands words that total up to precise communication of facts, ideas, and opinions.

The typical mind is idling most of the time, indulging in reverie, rehashing old quarrels, reliving old pleasures, a sort of no-man's land between awareness and sleep. The mind needs this form of relaxation occasionally, but too much mental ease invites a spider web of daydreams and the haze which dims the imagination.

Words are tools of thought. They can't go to work without the impulse of an idea. No idea can find dimension or proportion without definition in words.

Thinking requires the expenditure of mental energy, and there is no acquisition of essential answers without fatigue for the mental muscles. The most annoying person is the verbal parrot who says, "You know what I mean. You know what I mean." It is apparent that he hasn't the capacity to express himself and expects the listener to decode his confused thinking.

EXACTNESS IS WRITER'S RESPONSIBILITY

Precision in meaning is probably the greatest single need in meeting the problems of religion, politics, and economics in any day. Refusal to understand may come from the unwilling mind of the foe who can distort our best intentions into evil ideas. That is his responsibility. But when misunderstanding is the result of lack of skill in putting words together, then the fault is ours and the fault is serious.

If words are tools of thought, who uses them and by what authority? Who are the principal word handlers of the nation, and what is their responsibility with the tools of expression? The scientist creates his own jargon of Latin and Greek derivatives to cover the range of his thinking, postulates, and experience. As a matter of precaution, he often writes down a set of definitions as they apply to the immediate time and place. Economists and diplomats use the mutually limited definition to prevent disputes which may arise from marginal interpretations.

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The moralist dealing with social and ethical problems seeks to find a common set of premises and terms that will be acceptable to all, but faces the wide range of difficulties brought about by custom, climate, and language. The merchant finds his terminology subject to rapid change and interpretation as trade falls under government supervision and is influenced by social behavior and foreign intercourse. The lawyer, caught in the eternal wrangle of principle versus pragmatism or between tradition and experience, leans on citation and utility to give support to his interpretation of the law.

The ethical responsibility of the writer for a business paper or technical publication grows more significant as the world grows smaller and society works harder at finding a common basis for existence. Never in the history of the world has there been such a delicate balance between sanity and folly, between the rational and the emotional, between the esthetic and pragmatic, between the spiritual and the material, and all of these elements bear heavily on the judgment of men and women whose word skill in leading the opinions and ideas of others must be matched with an equally sensitive conscience.

WRITER CANNOT SERVE TWO MASTERS

Many of us are special pleaders. We are hired for that purpose, and we are inclined to be selective in presenting the best facets of the product, service, or policy which pays us our salaries. In this area we encounter all of the aspects of relative ethics. What then is our duty to fact, to candor, and to the whole truth? Should a man tamper with fact by omission or commission for the benefit of an employer? The advertising copy-writer, the political editorial writer, the technical writer in competitive journals, all face this decision daily, and they cannot avoid the stain on conscience if they knowingly mislead or deceive. Absolute truth is often difficult to fix in our complex social and technological world, but we may have faith in our sources of information as well as fact to support our opinion or premise. The will to be understood implies integrity and a desire to communicate without reservation in fact. There can be no other choice, no exception. No writer can serve two masters if one of them rejects truth as a basic and total objective. He has to be true to himself, and to recognize his responsibility at all times. If he enslaves himself to opportunism, or compromises with conscience, he becomes an unmoral robot.

Perhaps the primary step to understanding is recognition of self in the pattern of life, a sense of destiny, and a willingness to accept the responsibility that goes with it. Man is gregarious and social life brings with it the necessity for reasonably accurate communication.

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The spoken word or written word as a tool of logic and emotion has three values — (1) the dictionary meaning, (2) the context meaning which magnifies or minimizes the value of the word by association, and (3) inflection which is the subtle device of the zealot and demagogue, but can be the fair instrument of the prophet and merchant.

VERBS AND DYNAMICS

To the businessman as well as the writer, words are tools of the imagination used with skill to convey specific dimension, general impression, and a prismatic shading of ideas that are unmistakable in dimension, texture, and application. The key word in any sentence is the verb because it commands the degree of action desired by the speaker. The dynamics of writing come from the quality of the verb. The noun gives substance and the adjective adds color, but it is the verb that gives momentum to ideas.

Emily Dickinson, writing of the snake, said, "It wrinkled, and was gone." "Wrinkled" is the active and economical word because it compels a mental picture that saves a dozen words of explanation. A critic's comment on a writer reads, "His work is rich in implication — full of interlinear whispers." Poets define the talent of suggestion, a talent observed in the art of the Japanese print maker with "the skill to do and the will to refrain," as "the artistic hint." Economic statement employs the true virtues of rhetoric by selecting words, terms, and metaphors that imply but do not amplify. The amplification is left to the mind of the reader.

Language and literature are made in the market place rather than in the classroom. Words are born and bred of action, anxiety, and conflict. They are bred in folklore more often than in academic and scientific discussion. The test-tube babies of the dictionary are the result of the synthetic matchmaking of the technician who has an acquaintance with Latin or Greek. Fortunately, the language of scientific communication is limited to the laboratories and few of these terms get into speech idiom or literature.

The writer with a good ear selects words whose sound, color, and textures are the right quality for the mood or message he is expressing. The skilled crafts-

man does not deliberately search the bins of memory and weigh each word, but unconsciously feels and selects the right word when he touches it.

Sensitivity to word values is of utmost importance. The vowel in a word gives it substance while the consonant gives it color, and the writers of poetry or prose must coordinate sound and sense without a sacrifice of either. There is always the temptation to use words merely for sound effects as Lewis Carroll did so effectively in "Jabberwocky," where he introduced many meaningless but plausible sounds, letting the music of the poem run away from the sense.

MOSAIC ARTISTRY IS ANALOGOUS

A mosaic and a well-written poem, story, or essay have similar characteristics. The mosaic is made of brittle bits of glass and stone and the artist with skill and patience transforms them into a pattern of beauty. The many-used fragments fuse into an inspired concept, some finding a place in the picture while others are discarded because they are not the right tint, shape, or size. Every writer has at his elbow a treasury quite as huge as the artist in mosaics, but he selects his material by sound rather than color, by meaning rather than size, by inflection rather than shape.

The unabridged dictionary has a half-million words, but neither the businessman nor the professional author has use for more than fifteen or twenty thousand of them. A careful writer is sensitive to the physical properties of words. Some are sharp and abrasive, some are soft and tenuous, some are heavy and dull. He fingers them like coins, a few bright and new, some are worn beyond recognition, others have lost their value since they were first minted in the minds of Chaucer, Milton, Jonson, Bacon, or Shakespeare. New words are born, some are borrowed. Words die, and sometimes are resurrected.

The skilled writer never admits that there is such an ally as a synonym. He cannot use one word in place of another without discoloring or weakening his statement. He dares not use many weak words because he is unable to find one exact strong word to carry his meaning. He is a true magician who can take tired little words, recharge them with power, and make them sparkle by the wave of his wand.

Words are born, flourish, and die; words change their color and their meaning with the centuries; words lose their teeth and their sting; some words even lose their beauty. Various words become soiled by profane associations or regional slang. The modern writer seldom uses obsolete words and phrasing unless he is writing costume language. He takes the speech of the day — with all its charm and fault, with all its harmony and discord — and writes in the language of the people.

The function of the metaphor is condensation and illumination. It substitutes a picture for a paragraph. It translates an abstraction into an image. Phrase making and slogans employ the economy of metaphor or its related figure of speech. The effective metaphor opens the album of memory and flashes a picture that is eloquent in detail. Men think in pictures and the whole process of thought is a flashing of images on the mirrors of the brain.

The alphabet grew out of the ancient ideograph. The Chinese use a vast number of characters, each a pictorial symbol for a word; it is a language of solid metaphor. In our country, the sign language of the American Indian is one of visible metaphor. When the Dakotah chief drew his hand sharply across his Adam's apple and pointed to a distant figure on horseback, he meant that the rider was a Sioux, who was always called a "cut-throat." Had the chief leveled his hand across his forehead, the rider would have been a white soldier who wore a broad-brimmed hat.

Variation in meaning has a far-reaching influence in a discussion of business and the whole pattern of economics. Unless a word implies exactly the same thing to all the experts, they might as well fence at forty paces, or antic like rhetoricians who make up meanings as they go along in the manner of Humpty Dumpty who said, "When I use a word . . . it means just what I choose it to mean — neither more nor less."

HEDGING THROUGH FINE PRINT

Most of the fine print on legal contracts is an attempt to put verbal slipknots in small text after the bargain is tied in general terms of agreement. The "Act of God" clause is more likely to be the act of man looking for a hedge through which he can escape when the unexpected happens.

A writer's approach to meanings should be sensory and preferably tactile. The sensitive writer grips and fingers words like a mason testing the grit of sand and gravel. The smooth stuff won't hold. Neither will abstract terms which have been pumiced on the endless strand of dialectics.

It is a large pantry from which writers and speakers may choose, but the full shelf is no guarantee of the skill of the cook. The mastery of the few is to be preferred over the association with the many. The game of words is won in understanding, and communication is a personal contact between the speaker and his audience.

The spoken word is aided or hampered by the quality of voice and mannerism of the speaker, but despite this the well-informed person on the public platform inspires confidence. He may be tongue-tied, harelipped, and shiver like an aspen; if his words ring with under-

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standing and convey exact meanings, the listener forgets all else.

The art of putting words together is an exercise in communication. Texts of a great number of supervisory instructions in a large motor company were made under the watchful eye of a college professor. He found that oral instructions from managers to supervisors and foremen were better understood than written instructions. Why? The managers seldom wrote the words that they spoke. They employed two separate languages, one oral and one written. When they sat down to write, the simple declarative sentence and the simple command of conversation were forgotten, and the meaning was clouded and confused in the written message.

There is no greater need in communication than word skill and word dimension. The merchant, devising terms of sale or providing technical limitations to a contract, is called upon to use words which mean the same thing to the party of the first part as to the party of the second part. The feather-edged word leads to ambiguity. The flint-edged word allows little margin for error.

Meaning, then, first comes from the will to be understood in exact terms — not the Humpty Dumpty change of double talk. Bargainers cannot freeze meaning to semantic decimals unless the heart and mind seek understanding, too.

Men are confused by endless search for meaning
Among the words abused
By friend and foe
And there's little in the gleaning
When the easy yes or no
Is lost amid the weedy tangle of deceit
That strangles candor like the cockle in the wheat,
Some words are hard and square
And you can grip them anywhere —
Words like house and bread, or axe and plough,
Other words are smooth and round
Made of elusive sound,
White as ivory balls glistening before the candle
Words without a handle,
Truth, freedom and honor
Conundrums from the tongues of sibyls,
Symbols for which the statesman quibbles
Until Deception is the final donor —
Words like dollar, sterling, franc
Which cast their shadows over flags and mottoes
While envy crawls into the marble grottoes
And hate looks through the wicket of the bank,
Words like treaty, sanction, charter
Made decent by the ribboned document
Or the official kiss of men
Who stoop to barter
State and citizen
In the bad breath of Judas, Ananias, Cain,
Then go by the way all traitors went
Marked by the silver stain;
And there are words like gentle, brave and kind
Shining like dew drops after rain
Or burning the darkness for the blind,
Words that make the crystals chime
With music and with meaning through all time. Ω

LETTERS

(Continued from Page 2)

he sees for months or years is a flood of reports.

The other aspect of appearance is the care in preparation of the text. Poor grammar, misspelled words, run-on sentences (very common in technical reports) all reflect on the care of preparation. Recall your own experiences in reading magazines or newspapers; don't you become annoyed at petty errors that should be caught in proofreading? If you become annoyed, just consider the annoyance of a general or vice-president who was not sure that your company could do the job! Poor public relations comes from such apparent inconsequentials. Always bear in mind that everything in your report, good or bad, reflects on your company.

As for timing, if Lieutenant Doe has to report on your project on the 15th of the month, do you really believe that Colonel Roe will be satisfied with the knowedge that the report will not be received until the 16th?

The foregoing considerations are not the only factors that influence your public relations through reports. Other factors of a special nature count too. Misspelling the contract officer's name is a very good way to make enemies, and listing the wrong branch of service or the wrong division of the customer is certain to cause someone discomfort.

The reason your written material is important as an instrument of public relations is because of the nature of public relations. PR is a reflection of attitude or impression; it is not a sale of an automobile or a soap. It remains long after the actual project is finished. It can be hurt but never helped by outside influence. It is your "name," something that you earn through tireless effort and something you can lose in a moment. Good PR is essential to every company and is created by every activity of the company. Let no one say that your reports destroyed its good name.

Joel J. Shulman
Pall Corporation
Glen Cove, New York

To Editor, *STWP Review*:

Many people come away from a professional conference or seminar expressing the attitude, "It was all very interesting, but what did I learn?" I think this is especially true of people who have just attended their first conference. Back home in the office or the laboratory, they begin to wonder about the value of such a gathering. "Some of the lectures were interesting or entertaining, and some were quite dull. But, taken all together, they actually told me little that I didn't know already, and only a fraction of this new information applies to my situation. Was it worth it? Or was it a waste of my time and the company's money?"

I am a technical writer, working for a large corporation. In the past four years, my company has sent me to several conferences or seminars for technical writers and editors. From attendance at these gatherings, and from conversations with other writers who have been sent to the same or other conferences, I have drawn some conclusions regarding the purpose of such meetings. Perhaps these conclusions will help to answer the questions that many people, including myself, have raised concerning their value.

In the first place, we must agree that the impressions noted in the first paragraph are true—as far as they go. Some of the lectures given at professional conferences are interesting and some are not. In all the flood of words formally addressed to a professional audience, there is contained a little information new to each listener. A little of this new information will be useful to him. Considered in this regard alone, conferences are of limited value, and the cost of attending them would be difficult to justify.

However, I maintain that the presentation of new and useful information in lecture form is not the primary function of a professional conference. There are at least four functions that are more important, as I hope to demonstrate. Indeed, the lecture periods are not necessarily the most beneficial parts of such a conference. Question periods, discussion periods, even breaks, luncheons, and after-hours informality can be at least as valuable as lecture sessions. Let's see why, considering the other functions of such gatherings.

A professional conference or seminar is, first of all, a *convention*. Now, the word *convention* may suggest different things to different people. By using it, I mean to imply simply the satisfaction and exhilaration that the individual derives from an escape from the routine of his job and a fellowship with his professional peers. People having a common occupation, speaking the same professional language, and having similar problems on the job can experience a kind of "togetherness" as surely as can people bound by other ties such as kinship. Bringing people of like occupation together, and thus providing the opportunity for such fellowship, professional conferences cultivate this feeling. The people who attend are strengthened thereby to return to their tasks among other people of different, though perhaps related, professions and activities.

A professional conference is also a *consensus*. Not a consensus of opinion, for that would offend the conservative grammarians among us, but simply a consensus. On the job, each of us develops professional idiosyncrasies. We live in a semi-isolation, relieved to some degree by the reading of professional journals. We develop both good and bad work habits, ways of thinking, methods of procedure. Meeting with other members of the same profession, each of us is able to compare his ways with other ways. We can thus learn new and better job techniques, and discard some of the inefficient methods we may have developed in isolation. In this way, too, the entire professional group evolves common practices. These practices help to bind together the members of the profession, to develop the *esprit* that is vital to any profession. This combination of ideas from many individuals to achieve a common better way I am calling a consensus. Certainly, every professional conference is an opportunity for the development and dissemination of such a common way.

The concept of a *retreat*, in a professional rather than a religious sense, also applies to a conference. Consider our profession, technical writing, for example. Once we technical writers went to school, presumably to learn how to write. We studied grammar and punctuation, sentence structure, literary forms, style, etc. But somehow, as the years pass and we work daily at our tasks, we begin to forget. We become careless of the rules we once learned, partly because so few of the people among whom we work are aware of these rules. A professional conference ought to give to us who attend some reminders of these first principles and an opportunity to meditate upon them. Like a religious retreat, it should provide a season of withdrawal for contemplation. Having established these principles afresh in our minds, we can go back to our tasks better prepared to do them well.

Finally, a professional conference should be a kind of *revival*. It is only natural that human beings, even professional people, grow weary of the daily grind. They become indifferent to the quality of their work, half-persuaded that it doesn't matter anyway. What they need is a revival! They need someone to inspire them to new heights of creativity, to give them a vision of a brighter tomorrow. They need an opportunity to rededicate themselves to their tasks. They need, if you please, a half-time pep talk to send them back out fighting. A con-

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ference is the perfect opportunity for the delivery of such a talk. It has been my experience that this opportunity is often neglected.

Convention and consensus, retreat and revival—a conference should be all of these things. Viewing the matter in this light, we can see that the formal program of such a gathering is only the framework, the skeleton, of a living conference. It merely provides the excuse for professional people to meet, so that they may take part in these more important functions.

And what, then, of the lectures? If they are interesting or entertaining, fine. But let's make no mistake about it—they are intended to prompt rather than to direct, to inspire rather than to inform. It will be well for the success of every future professional conference if those who are engaged to speak bear in mind these facts. They should understand clearly their true function before they begin to set down even an outline of the remarks they wish to make. Only if their thinking is guided by these considerations will they be able to make a significant contribution to the success of any conference.

We who attend such gatherings have a responsibility, too. We must realize beforehand the true nature of the benefits we may hope to receive from attending conferences. We may then take steps to maximize these benefits, to help make professional conferences really worth while for ourselves and our fellow conferees.

Donald V. Etz
National Cash Register Company
Dayton, Ohio

To Editor, *STWP Review:*

In answer to your request for suggestions on reprinting papers and in answer to Mr. R. D. Taneja's request for information on how to review books, I submit for your consideration "Reviewing of Technical Books — the Minimum Requirements" by E. H. McClelland, *Journal of Chemical Education,* vol 25, 1948, pp. 380-382. Mr. McClelland also refers to a French book on the topic, vintage 1916; perhaps a translation of it could be serialized in the *Review.*

Ernest M. Cohn
U.S. Department of the Interior
Washington

Editor's Note: A most readable book is CRITICAL WRITING FOR THE JOURNALIST by Roland E. Wolseley (Chilton). Although not directed toward technical books, Chapter 8 is of particular value with its examples of possible types of book reviews.

To Editor, *STWP Review*:

Charles Wilson, former President of General Motors, once told a Congressional committee: No physical activity goes on in our modern age without a piece of paper going along to guide it."

The inter-shift memos that dispatchers write to each other help to guide a company's production, making them highly important little pieces of paper. Because they are so important they are worth writing well.

A memo must achieve two objectives: (1) it must tell the reader what to do and (2) it must make the reader *want* to do what it suggests. These objectives can be achieved only if the memo has *clarity* and *good tone*.

Clarity is the art of saying what you mean in a way that is perfectly clear and understandable to your reader. To achieve clarity, stick to the facts and be brief, but use enough words to make sure your reader gets the message. Short, code-like messages may look efficient and businesslike, but they're not much good if your reader must waste his time trying to figure out what it's all about. Don't play guessing games with the other dispatchers. Take the time to write it clearly.

Tone applies not to what you say but how you say it. A memo can antagonize the receiver, hurt his feelings, and make him instantly dislike the writer. Another memo, saying exactly the same thing tactfully and considerately, will win wholehearted cooperation. Test the tone of your own communications by asking yourself these questions: (1) Have I expressed my ideas so the reader will feel that I am trying to be helpful, courteous, and human? (2) Have I expressed them so they reflect good human relations with my associations?

Here is an inter-shift memo written recently by a dispatcher:

> Hot 1117508 — Must run and make S. A. tonight.

Notice how the writer has sacrificed clarity for brevity, and how the use of the word "must" makes it sound like a case of "get this done or else."

The same message written a different way reads:

> 1117508 — I would appreciate it if you will make a send-ahead on these parts. Central Control says the line will run out in the morning.

See how a few extra words make the message clear. The tone is improved by taking out "must" and inserting the gentler "I would appreciate . . ." The receiver is also sure to appreciate the writer's taking the time to explain why it is important for him to get out the parts.

Here is another memo one dispatcher wrote to another:

> 1115326 — On rivet machine

A real masterpiece of confused communication, isn't it? The revised version makes a little more sense:

> 1115326 — There is plenty of work for your rivet machine operators tonight.

Another example, geared to get any dispatcher's day off to a bad start states:

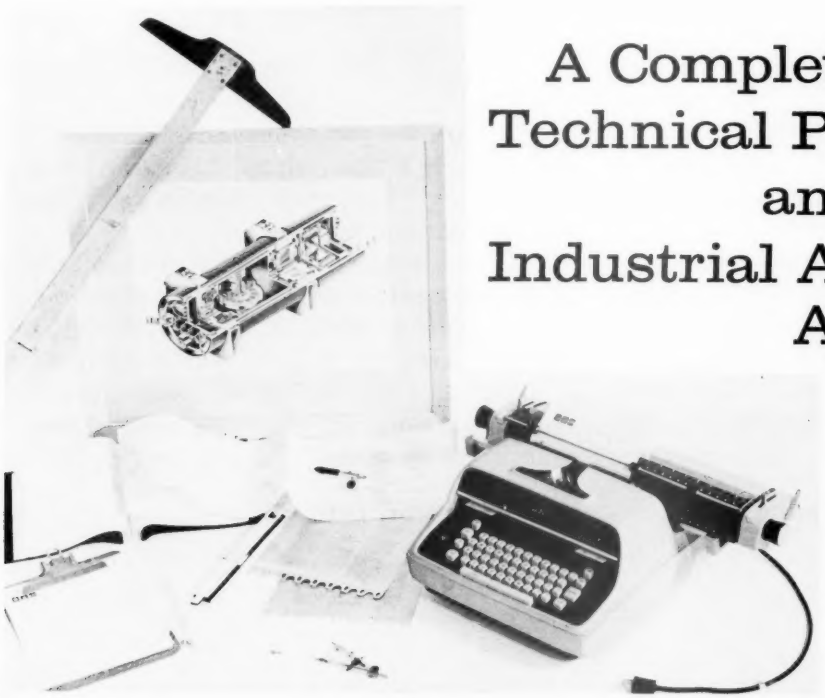
> 115201 — On welder — move through belt sand, str. & blanchard opr. tonight.

Would you guess this is what he was trying to say?

> 115201 — We worked the welder today. Please run again tonight, and, if possible, move through belt sand, straightening and Blanchard operations. I'd appreciate your help in getting them to Department 093 as soon as possible.

Remember! Those little pieces of paper you write are pretty important. If they're worth writing, they're worth writing well.

Glenn Kerfoot
IBM Corporation
Lexington, Kentucky



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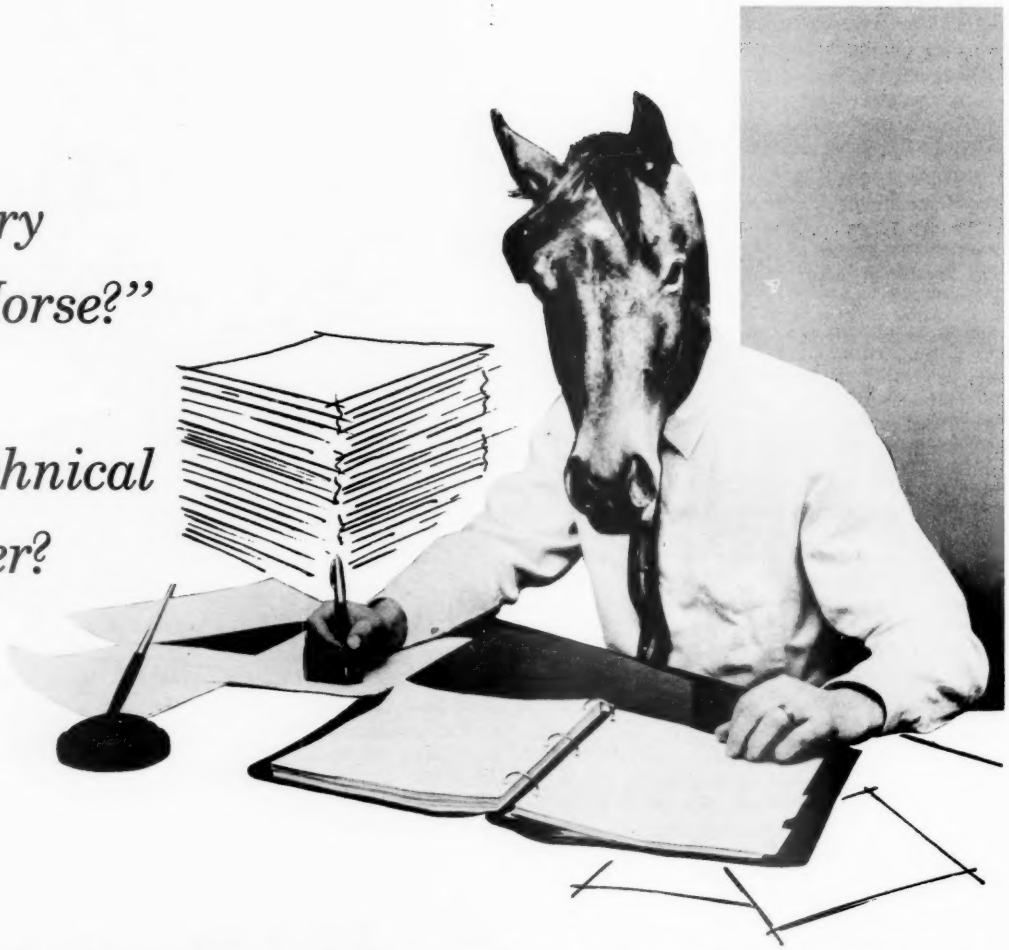

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